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THE AMERICAN JOURNAL OF CANCER
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American Journal of Public Health
and THE NATION'S HEALTH

Volume 24 March, 1934 Number 3

Germany's Sterilization Program

W. W. PETER, M.D., DR.P.H., F.A.P.H.A.

ON January 1, 1934, Germany began to put in force a program to sterilize those of her citizens legally adjudged unfit for parenthood. A government announcement states that approximately some 400,000 are to be sterilized in a short time. In a country where law still means as much as it does, where under the present regime orders from the top reach down to the very bottom without the obstruction, delay, detraction, and dilution which minority and opposition parties contribute, yet where nothing of this kind on such a wholesale scale has ever been attempted, where considerable undercover opposition exists, this particular program which Germany has launched merits the attention of all public health workers in other countries. If the objective of eliminating parenthood by those unfit is actually achieved in a thorough but legally and scientifically fair way, Germany will be the first modern nation to have reached a goal toward which other nations are just looking, or approaching at a snail's pace. What will actually happen remains to be seen.

The enabling law on which this program is based was enacted July 14, 1933, and promulgated [1] July 25, to go into effect January 1, 1934. Only once in this law containing 18 sections is the word "sterilization" used, and then it is in parenthesis. The favorite term often repeated is "unfruitful" (*unfruchtbar*).

The core of the law is contained in the first section. My translation has been checked by a jurist who studied in the United States. It reads:

> Those hereditarily sick may be made unfruitful (sterilized) through surgical intervention when, following the experience of medical science, it may be expected with great probability that their offspring may suffer severe physical or mental inherited damages.
>
> The hereditary sick, in the sense of this law, is a person who suffers from one of the following diseases: inborn feeblemindedness, schizophrenia, circular insanity, hereditary epilepsy, hereditary Huntington's chorea, hereditary blindness, hereditary deafness, severe hereditary physical deformity. Further, those may be made unfruitful who suffer from severe alcoholism.

Application for this treatment may be made by the individual and will be received when it is accompanied by a certificate from a national licentiate physician attesting that the applicant has been instructed concerning the nature and the consequences of this operation. For those legally incapable of managing their own affairs, guardians, courts, legal representatives, and trustees may make application. This procedure may also be proposed by medical officers in official health organizations, and by

superintendents of hospitals, of medical institutions, of insane asylums, and of prisons on behalf of inmates.

To avoid miscarriage of justice, there are a number of important safeguards included. The most important of these is the decision of the government not to use the ordinary existing courts of the land. Instead, 1,700 Hereditary Health Courts (*Erbgesundheitsgericht*), and 27 Hereditary Health Supreme Courts were in process of establishment immediately after the law went into effect on January 1, 1934.

Each Hereditary Health Court is to articulate with the District Court in the same area. It shall comprise a district judge as the presiding officer, a medical officer, and one additional person whose qualifications are that he shall be a national licentiate physician of proved competence in hereditary health learning. For these three members of the court, alternates are to be appointed to serve when necessary. The law states that the supreme authorities of the land are to designate the court members, the alternates, the places, and the districts of both lower and higher courts.

A second safeguard in the law is that all applications must be in writing. Facts supporting the application are to be substantiated through medical opinion or otherwise. The court office is obligated to notify the medical officer of the application.

A third safeguard is that jurisdiction for the making of a decision lies with the Hereditary Health Court in the district in which the person to be made unfruitful has legal residence.

Fourth, no judge can serve as presiding officer in one of these special courts in a case where he has rendered a decision appointing guardianship, nor can a medical officer who has sponsored an application function in his other capacity as a member of the Hereditary Health Court in the same case.

Fifth, the proceedings of a Hereditary Health Court are not public. Such a course would be a sad blow to a certain stratum of American newspaperdom.

Sixth, the Hereditary Health Court is obligated to institute necessary investigations, call and interrogate witnesses and experts. Physicians who serve as witnesses or experts are obliged by the court to divulge information without observing professional secrecy. Judicial and governmental officials are similarly compelled to give all necessary information as the court may request.

Seventh, after an unhampered decision, the verdict of the court must be signed by those who participated in the decision regardless of whether this was for or against a given application. The written decision must include the reasons on the basis of which sterilization was approved or disapproved. This decision is then transmitted to the medical officer, to the person whose sterilization was up for decision, or to this person's legal representative.

Eighth, if the court decision is in the affirmative, it remains inoperative for 1 month. During this period the same persons entitled to file an application are likewise allowed to file an objection. Thereupon the case is reviewed by the Hereditary Health Supreme Court. If no complaint is filed against the decision of the lower court in the allotted time, the decision is automatically subject to execution. The decisions of the Hereditary Health Supreme Court are final.

The Hereditary Health Supreme Court is organized on the same basis as the lower court. It articulates with the Supreme Court in that area. Its composition is a supreme court judge, a medical officer, and a physician who is qualified in hereditary health.

A ninth safeguard is that the authorized sterilization operation shall be performed only in a hospital by a national medical licentiate. The supreme state government designates the hospitals and physicians eligible for

executing court decisions. But the operation may not be performed by any physician who has participated in the court procedures in a given case. The operating physician must send a written report to the medical officer certifying that he performed the sterilization and also by what method.

Tenth, persons participating in any capacity in the proceedings of the court are obligated to maintain secrecy. Failure to do so makes the talkative person subject to an imprisonment up to 1 year, or to a money fine.

Once sterilization has been refused court authorization, reconsideration is permissible only upon the receipt of new facts.

Sterilizations not carried out in accordance with this law, as well as castration, are permissible only when a physician acts in accordance with the known rules of medical science to avert a serious danger to life or health of the patient, whose full consent must be obtained before the operation is performed.

Once the court renders a final decision ordering sterilization, it is to be performed even against the wishes of the person most concerned, and even with the help of the police authorities to whom the medical officer may apply to take the necessary steps. When other measures fail, the employment of force is permissible.

The expenses of court proceedings are to be met with state funds. The surgical operations and hospital care are to be paid by sickness insurance funds where the patient is a member, or by public welfare funds where the patient is not a member of the sickness insurance funds and is needy. In carrying out court decisions, medical and hospital fees are to be prescribed. Only the minimum schedule of expenses may be paid from state funds. Where the patient or his family require more service than this minimum affords, they must pay the difference.

This law was signed by the German Chancellor, Adolf Hitler, by the Minister of the Interior within whose jurisdiction fall matters of public health and medicine, and by the Minister of Justice. All of the important features of this law are included in this presentation.*

There is a separate law regarding the sterilization of chronic criminals which has plenty of teeth in it. To avoid confusion and achieve reasonable length to this paper, no further mention will be made of it at this time. Here we have to do primarily with hereditary diseases and their prevention as outlined in this German program. For this same reason other laws on fostering marriages and children through financial aid, land inheritance laws, civil service and racial discriminatory laws will be omitted here.

During my 6 months in Germany, in which I traveled over 10,000 kilometers in every major section of the country, it was my privilege to meet some of the leaders in the present political regime who are responsible for new undertakings in reconstruction of the social order. I did not always agree with their points of view. But they conceded this to be my privilege. Public health practices are fairly well stabilized in this country to suit German conditions and, apart from changes in personnel and in budget, are not being seriously disturbed. The one most interesting new thing is the government's racial hygiene program of which this sterilization program is but a part.

To a foreigner there are many reasons to explain why, suddenly, this government has launched such a sterilization program. A viewpoint prevails that Germans must live with themselves within their own borders for the

* Two copies of the original promulgation by the government are on file in the office of the American Public Health Association for any who wish to make an exact and personal study.

immediate future, and depend more than ever upon their own resources. These resources are much depleted. Hence the present load of socially irresponsibles are liabilities which represent a great deal of waste.

The people have acquired a state of mind accustomed to change. So many bewildering changes of one kind or another have already been introduced during the past year that another innovation does not stand out in sharp relief. Already on their way toward changes it is not such a far jump to a philosophy of life which says in effect that human breeding is not an innate right to be exercised by all adults possessing the necessary anatomical parts, but instead, a privilege to benefit the individual, the family, the community, and the state. The state has not determined who shall breed, but in this and other laws it has most definitely stated who shall not become parents, and why.

To explain the economic reasons back of this program it is not enough to say that Germany's load from the outside is the cause—reparations, government and private post-war debts, loss of colonies, and the decline of the foreign trade; nor alone to internal loads such as the long pull toward recovery from the 1923 inflation, unemployment, war and old age pensions. These are loads which other nations are carrying also.

There are other factors which point more directly to the necessity of a sterilization program. The census of June 16, 1933, showed a total population of 66,165,879.[2] Of this number 738,334 are handicapped as follows [3]:

Physically crippled	429,654
Mentally deficient	230,112
Deaf and dumb	45,376
Blind	33,192

Another category comprising 167,854 persons lists those requiring institutional care [4]:

Insane and epileptics—	302 asylums with	141,910 beds
Feebleminded—	92 asylums with	24,519 beds
Chronic alcohol and narcotic addicts—	33 asylums with	1,425 beds

On March 31, 1932, there were 3,854,520 persons receiving public funds. Of this number there were only 40,614 war cripples listed, and 216,199 unemployed. These few quotations from the *Statistical Yearbook of Germany for 1933* give some indication of the weight of the internal load the German social order is required to carry.

Under these circumstances it is no wonder that the German government is trying to discover ways to lighten the load. To one who lives here for some time, such a sterilization program is a logical thing.

On the one hand the government is bending every effort to organize the 1,700 lower and 27 upper Hereditary Health Courts. On the other, it engages in widespread, varied, concentrated propaganda. Under the direction of the German Medical Society, 17 special films are in preparation. Other films have already been prepared and shown. Special magazines dealing with the entire race hygiene problem have been founded with government aid. There have been a number of special conferences called by the government for physicians. At the one I attended 498 physicians paid 5 marks each for registration fees for the 3-day session. We sat from 9 in the morning till 1 or after in the afternoon, and then after lunch were taken to visit hospitals and asylums where cases were presented and discussed. At another medical congress of the same kind the course lasted for 7 days, cost 25 marks registration fee, and so many physicians enrolled that the list had to be closed. Such training schools are being operated all over the country with great success except in the strongly Catholic areas.

An example of government sponsored newspaper propaganda is the following account which was sent out from Berlin and appeared in different parts of the country [5]:

On January 1, the law to prevent hereditary sick progeny comes into force. In the entire country by January 1, there will be established 1,700 Hereditary Health Courts and 27 hereditary health high courts.

Scientific investigations have been under way to determine the number of those who within a short period of time must undergo sterilization. These estimate the number to be around 400,000, distributed among the 9 diseases which the law defines as hereditary. The larger portion, in fact, one-half, are those suffering from inborn feeblemindedness. This approximation of 400,000 is about equally divided between males and females.

Also over the costs of making a person unfruitful there is information available. In the course of time these will be lessened very greatly while experience in this direction accumulates. Today one estimates the cost of an operation on a male to be about 20 marks. It is so simple to carry out that the man need stay on his back only 4 days. Calculating on the basis of 200,000 males, the total cost will be about 4,000,000 marks. Somewhat more ceremonious is the operation on a female. She requires at least 8 days in a hospital and an expenditure per head of approximately 50 marks; so that the sterilization of 200,000 females will cost 10,000,000 marks.

These 14,000,000 marks constitute a special burden in the first years. But the investment provides such rich interest as no other capital has ever returned. Professor Lenz has calculated that the very least the hereditary sick are costing annually is 350 million marks. Friedrich Murgdörfer comes to an amount of not more than 1 million marks difference. Measured in these figures the expenditure of 14 million marks is entirely insignificant. After 10, 20, or 30 years it is certain that the yearly expenditures of hundreds of millions of marks for the hereditary sick will decrease markedly. Providing the money will be in the greater part through the carriers of social insurance.

The opposition voiced thus far has centered largely around Catholic church influence. This influence flows through many church organization channels both inside and outside Germany. Open opposition can no longer be voiced by the Catholic party, for this Centrum party in common with all others has been suppressed. Neither the Catholic church nor the German Government is inclined to yield. The only way out may be the adoption of the proposal now under discussion whereby this church as such will assume full and exclusive responsibility for the care of those of its members who come within the purview of this law and should be sterilized. Then comes the question of how far institutionalizing these unsterilized hereditary sick should go to safeguard the communities in which they live. No answer has as yet been found to that question.

Since this law was enacted the customary leaves of absence for inmates under institutional care for the mentally sick have been withdrawn lest undesirable impregnations occur. The law will be applied on a wide scale first in asylums among those ready to be discharged, and among the feebleminded.

In March when I pass through Germany on my return from the Balkans I shall renew some of my present contacts to secure further information on what Germany's experience has been since the law went into effect.

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Practical Limitations in the Attempt to Control Enteric Disease by the Examination of Specimens Collected Without Regard to Clinical History or Epidemiological Evidence*

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THE attempt to control enteric diseases through the examination of specimens collected as a routine procedure, without selection, from all food handlers or persons engaged in other occupations in which the carrier condition might render them a menace, seems in the light of our experience to be inadvisable. The findings do not justify either the work or the expense.

A study of specimens of feces and urine from food handlers in a number of state hospitals in 1924 and 1925, after outbreaks of typhoid fever had occurred in two of them, illustrates this point. Cases of typhoid fever had been reported within a period of a year or two in all of the hospitals from which specimens were received, with two exceptions. The findings in the specimens from these two hospitals are of particular interest. From one, 116 specimens were submitted from 53 food handlers, and no carriers of *B. typhosus* or *B. paratyphosus* were found. From the other, 2,053 specimens were submitted from 813 food handlers. Two carriers of *B. typhosus* and 1 carrier of *B. paratyphosus* B were found. *B. typhosus* was isolated from 1 specimen from another individual, but 14 other specimens from this person were not found to contain *B. typhosus*. If the first specimen was authentic, this particular food handler was probably recovering from an infection which had been unrecognized.

From the two hospitals mentioned, 2,169 specimens from 866 food handlers were examined and 3 carriers were found. Thus, the average number of specimens examined in discovering 1 carrier was 723. Assuming the cost of examining a specimen for *B. typhosus* to be about $2 when large numbers of specimens are handled, the finding of 1 carrier under the conditions mentioned required the expenditure of about $1,500.

In the examination of 6,269 specimens from 3,583 food handlers in the institutions where epidemics of typhoid fever were occurring or from which cases of typhoid fever had been reported fairly recently, *B. typhosus* was found in specimens from 47 individuals and *B. paratyphosus* A or B in those from

* Read before the Laboratory Section of the American Public Health Association at the Sixty-second Annual Meeting in Indianapolis, Ind., October 9, 1933.

3 others. In 18 instances, these microorganisms were isolated from only 1 specimen, which would suggest that the individuals from whom they were submitted may have been recovering from an infection. Thus, even when cases of typhoid fever are occurring in institutions, the examination of large numbers of specimens is required in order to discover the typhoid carriers among the food handlers, if epidemiological and other factors are not considered.

A false sense of security may result from the examination of a specimen or two submitted from each food handler, since every carrier of *B. typhosus* would not be discovered by this procedure. Even when a number of plates are used in the study and a most careful search is made, *B. typhosus* may be found in only a relatively small percentage of the fecal specimens obtained from some typhoid carriers.

The study of environmental factors, careful history-taking, and the submission of a series of specimens of feces and urine, or preferably a specimen of duodenal contents from food handlers who have had enteric disease, colitis, cholecystitis, etc., or whose immediate associates have had typhoid or paratyphoid fever, would probably result in the detection of most carriers of typhoid or paratyphoid bacilli among them. Of course, there are exceptions. When cases of enteric disease have occurred among patrons of a restaurant or on a milk route, series of specimens from all the food handlers concerned should be examined if the carrier is not found among those with suggestive histories.

Despite the fact that unrecognized cases occur, probably one of the best means of approaching the problem is by studying specimens from patients who are convalescing from typhoid fever or allied infections, in order to detect the ones who will become carriers. Since the submission of specimens from persons who have recovered from typhoid fever has been required by the New York State Sanitary Code, no cases of the disease, as far as the authors are aware, have been traced to an individual who has been released after fulfillment of the requirements.

In order to avoid the fruitless expenditure of time and materials in the examination of large numbers of specimens that have been collected without discrimination from various groups of individuals, the relative futility and excessive cost of such work should be explained to members of county medical societies and health officials. The same amount of money would yield vastly greater returns if expended in the pasteurization of products wherever possible, the improvement of sanitary facilities, the provision of training in personal hygiene, the removal from work and the treatment of food handlers who are obviously ill, the careful study of epidemiological factors, and the examination of series of specimens from individuals whose history or clinical manifestations warrant it.

Protein, Minerals and Vitamins of Evaporated Milk

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IN July, 1929, there appeared in this JOURNAL one of the first discussions of the nutritive value of evaporated milk.[1] Since that date, many of the statements about this food, which were then based on a limited number of researches, have been verified by a large group of experiments, both laboratory and clinical. Per capita consumption of evaporated milk has increased from 11.3 lb. to 12.5 lb. The national demand has grown by 189,600,000 lb. to an annual use of more than 1,560,000,000 lb.

If this rapid advance in consumer acceptance seems striking, so to a greater extent is the change in professional opinion in the last decade. In 1923, one of the government agencies warned that "evaporated milk may be used in emergencies for a short time only." In July, 1933, the Department of Agriculture said, "Evaporated milk is as valuable as fresh milk for food preparation."[2]

Notwithstanding the plenitude of such unequivocal comment, however, and although evaporated milk is considered a staple article of diet by millions of people, "certain persons cling to the belief that it will not be many years before investigators will discover it to be harmful. Many doctors are prejudiced against its use, while dietitians have been known to criticise adversely projects in low cost diets because it was used exclusively."[3] And, it might be added, even though the U. S. Public Health Service has declared that "children fed pasteurized, or other heated milk, thrive as well as children fed raw milk, and contract certain communicable diseases less frequently."[4] It is believed that the objections to evaporated milk still heard are conscientious and sincere, and are to some extent due to recency of much of our knowledge of the nutritional value of this food.

The early work of Marriott[5] and Brennemann[6] on evaporated milk in infant feeding formulae is widely known; but these workers, from the nature of their problem, stressed the protein characteristics more than mineral and vitamin content. Their papers were submitted before the conclusive findings of the latter were known. They are comparatively new, and have not had as yet an extensive circulation.

The general need has been for a review of *all* the known facts concerning the nutritive value of evaporated milk, in relation to each other. A résumé of that character is the purpose here.

PROTEIN

In March, 1929, Marriott and Schoenthal[5] stated that

> . . . the heating of the milk (during sterilization) brings about certain changes in its chemical, physico-chemical and physical properties. The casein undergoes alteration so that when subsequently subjected to coagulation by rennin or acid, a curd is formed which has much finer texture than that from raw milk. . . . There are good reasons for supposing that a fine curd from milk used

for infant feeding is desirable. . . . The known qualities of evaporated milk—its sterility, its ready digestibility and uniformity of composition—are distinct advantages which recommend it for general use as milk for infants.

The ensuing years brought concurring opinions from Brennemann,[6] Nicholson,[7] Kerley,[8] Reiss,[9] Dennett and Craig,[10] Sauer,[11] Kositza,[12] and numerous others. Altogether since 1929, 2,700 infants have been studied in evaporated milk experiments.[13] Kositza states:

From our own observations on weight increases, we conclude that in the early months of the infant's life, unsweetened evaporated milk has certain advantages in infant feeding. . . . From the standpoint of economy, availability, sterility, uniformity of composition, and easy digestibility, unsweetened evaporated milk has decided advantages over bottled cow's milk in infant feeding.

Nicholson and Reiss both reported the successful use of lemon juice as an acidifier and antiscorbutic agent in the preparation of evaporated milk formulae. Hill [14] has recently stated that the digestibility of cow's milk is inversely proportional to the curd tension. The curd tension of evaporated milk is 3 grams, as compared with a considerably higher value for raw milk.[10, 14] The White House Conference on Child Health and Protection declared: "It (evaporated milk) is an economical food and on account of its many advantages bids fair to be one of the most extensively used infant foods of today." [23]

MINERALS

The calcium, phosphorus, and nitrogen availability (findings on the latter element tying into the foregoing discussion) have been determined by Willard and Blunt,[15] Kramer, Latzke and Shaw,[16] and Jeans and Stearns.[17] The first two groups of researchers studied both children and adults, concluding that evaporated milk, on a comparative basis with other forms of cow's milk, can be given a very high rating in the ease of utilization of those elements. The last named experimenters, following an observation of 9 male infants, reported that

. . . dentition was early, the infants averaging 6 teeth erupted at 40 weeks. The physical development, as indicated by sitting and other performance, was very good. . . . The growth in length and weight was excellent and exceeded standard rates of growth and the rate of the average male infant of Iowa . . . the retentions of nitrogen, calcium, and phosphorus were high . . . early carpal ossification, rapid growth in body length, and the absence of clinical or chemical evidence of rickets are considered evidences of good bone growth.

To round out the mineral picture, Lewis and Stein [18] have shown that "the feeding of evaporated milk to normal rats produces a fall in hemoglobin without the corresponding drop in the erythrocyte count that occurs when raw milk is the sole article of diet." This phenomenon they attribute to the presence in evaporated milk of a trace of copper, which retards the development of nutritional anemia caused by the low iron content of milk.

VITAMINS

On vitamins A and D in evaporated milk, we may examine the unpublished findings of Farmer and Lemkau. Both vitamins, these workers found, are present in evaporated milk to the same extent as in the original milk, unaffected by evaporation, homogenization, sterilization, or storage. Barnes,[19] who observed a group of infants, reached the identical conclusion concerning vitamin D.

Koch and Samuels,[20] and Todhunter,[21] found vitamin G present to the same extent as in the original milk. Koch and Samuels reported a loss of about one-fifth to one-sixth of vitamin B in the evaporation process. As milk is not an important source of vitamin B, and since other foods containing it should be given, this loss is not significant. The same holds true with

reference to vitamin C. While heating no doubt eliminates a large part of it, milk, even in its original state, has never been considered, quantitatively, a good source of this vitamin. In fact, no infant or child is well fed without the addition of an antiscorbutic.

It is a correct assertion that in the vitamins of which milk is a good source, associated with growth, protection against respiratory infection, and pellagra, evaporated milk is completely dependable.

STERILITY

Deming and Davis [22] undertook a bacteriological study to determine whether evaporated milk was sufficiently free from viable microörganisms to be, from the bacteriological standpoint, a safe food for infants. For the investigation these workers purchased 154 "tall" cans from the open market. From each tin of milk both anaerobic and aerobic cultures were prepared. After observing such cultures from 102 of the cans at 37° C. and from 104 of the cans at 55° C., they concluded that

> . . . evaporated milk is not only free from pathogenic microörganisms, but may, for all practical purposes, be considered sterile.

USE IN SPECIAL CONDITIONS

Marriott and Schoenthal [5] early stated that

> . . . evaporated milk was especially suitable for premature infants; and, when suitably modified, was a satisfactory food for sick infants, especially those suffering from nutritional or gastrointestinal disturbances.

Their experience has been borne out by others. Poole and Cooley [24] indicate that prematures over 1,400 grams in weight

> . . . thrive well when a diluted, unsweetened, evaporated milk formula, with added carbohydrate, is gradually and carefully substituted for modified breast milk. Non-acidified evaporated milk has been found satisfactory for the larger prematures and during the period of after-care in the homes.

These two workers also used evaporated milk successfully in diarrhea cases,[25] reporting that

> . . . when diluted to one-half or two-thirds strength, with protein or carbohydrate additions, it proved to be a satisfactory formula for most of our patients as soon as they were able to take milk . . . the evaporated milk formulae can be readily adjusted in percentage, acidity, and consistency to meet these special requirements.

Cutler [26] has demonstrated that the denaturing of the whey proteins lactalbumin and lactoglobulin, in the course of the sterilization of evaporated milk, render it tolerable to milk-sensitive persons. West [27] has said, in regard to the feeding of the marasmic baby:

> A very digestible high caloric type of feeding is essential. The marasmic infant is usually intolerant to fats and sugars, and for this reason does not do well on the ordinary raw or cooked cow's milk dilutions with soluble carbohydrate additions. The easily digested unsweetened evaporated milk with additions of calcium caseinate and starch has been found to fulfil satisfactorily these requirements.

That the celiac patient can assimilate the homogenized fat of evaporated milk, was recently shown by C. V. Rice.[28] Unpublished work, soon to appear, indicates that from the standpoint of acidity and gastric motility, evaporated milk is useful in the treatment of duodenal and peptic ulcer, and other gastrointestinal disturbances.

FROZEN MILK

It is a curious fact that although millions of gallons of ice cream are consumed annually, and nutrition specialists recommend it as an excellent way of securing part of the daily milk quota, there are people who believe that the freezing of milk renders it dangerous to health. Palmer [33] has shown, in an experiment on albino and piebald rats, that

> . . . standard vanilla ice cream is a valuable supplement to certain types of diet for

growth. In addition, the same ice cream alone is capable of promoting growth at a moderate rate to produce mature animals of normal or nearly normal size and weight. . . . None of the animals fed the basal no ice cream diet attained the weight of the poorest animal fed this diet mixed with one-third by weight of ice cream, although the mean consumption of total nutrients was the same. Likewise, only one animal in the basal group attained the weight of the poorest animal fed ice cream alone. . . .

Louder and Smith [29] fed normal evaporated milk to one group of albino rats, and frozen-thawed evaporated milk to another group. All the rats were in good physical condition at the end of the experiment, and the researchers concluded that "none of the food value of evaporated milk is destroyed by freezing, and neither is there produced any substance deleterious to health." Dr. Helen Mitchell successfully used evaporated milk that had been frozen, during a nutrition experiment in Labrador.

FLAVOR

The sweet taste of evaporated milk (which is actually an assurance of proper sterilization, and therefore safety) is something some people still find a new experience in food. Those familiar with the flavor of raw milk find it necessary to make an adjustment to the taste of pasteurized. Hollinger and Roberts [30] undertook to determine "the extent to which evaporated milk would be generally accepted as a beverage without any preliminary period of becoming accustomed to it . . ."

They discovered that,

> . . . out of 921 individuals to whom diluted evaporated milk was served, 548, or 60 per cent, would apparently accept it without any preliminary period of learning to like it. The percentage of acceptance is greatest with younger children. . . . The ease with which the adults in this study changed their attitudes toward evaporated milk, however, indicates that prejudices can be overcome at any age provided the individual really desires to do so.

Of interest in connection with the Hollinger and Roberts work, is the report of hot school lunches prepared under the supervision of 57 teachers in 30 rural schools.[31] These lunches, in which evaporated milk was the principal ingredient, resulted in significant gains for underweight children, a decrease in absences, better morale, and improvement in the cold lunches brought from home. A positive liking developed for the flavor of evaporated milk.

REASONABLE COST

Two other factors of importance in the school lunch program just described, were the reasonable cost of the milk supply, and its convenient keeping qualities in the sealed tin, under conditions where refrigeration was impossible. Those are the factors which have made evaporated milk of utmost need in the welfare activities now being carried on to such an enormous extent throughout the country.

The goal of optimum nutrition has not been brought nearer of attainment by this situation described by the U. S. Children's Bureau [32]:

> One-fifth of the children in the United States have suffered definite injury to health during the depression. . . . Malnutrition in New York City jumped from 16 per cent in 1930 to 21 per cent in 1932, among 300,000 children examined annually since 1927.

If further and more serious depredations on the national physical well-being are to be prevented, careful attention must be given to providing those on relief with an adequate milk intake. That is a principle all nutritionists are urging welfare agencies to follow. In putting it into execution they are finding that the reasonable cost of evaporated milk is a definite aid. Mixed with an equal amount of water, evaporated milk provides a whole milk for every milk use. The dairy industry has learned "how to evaporate milk

efficiently and economically,"[1] how to transport it in sealed tins without refrigeration, and how to deliver it to the consumer sans the more expensive requirements of other methods of distribution.

SUMMARY

1. A brief review has been submitted of the research on the nutritive value of evaporated milk, together with mention of the findings on its sterility, use in special conditions, food value after freezing, flavor, and cost.

2. Many workers have shown evaporated milk to be a successful food for infants, attributing this experience in large part to the soft, easily digested curd precipitated in the stomach.

3. Studies with both children and adults have demonstrated that the calcium, phosphorus, and nitrogen of evaporated milk are readily available. Evaporated milk supplies the same amounts of these elements as do other whole milks.

4. It has been established that evaporated milk supplies qualitatively and quantitatively the vitamins milk is depended upon to supply.

5. A bacteriological investigation of evaporated milk has shown it to be sterile in the sealed tin.

6. Considerable success has attended the use of evaporated milk in cases of premature birth, diarrhea, allergy, marasmus, celiac disease, and gastrointestinal disturbance.

7. It has been proved that the freezing of evaporated milk does not impair its food value, and does not produce any substance deleterious to health.

8. A study of a large group of individuals has shown that children readily accept and like the flavor of evaporated milk. Adults also quickly become accustomed to it.

9. The reasonable cost of evaporated milk is of distinct service in assuring an adequate milk intake to families affected by the economic emergency.

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Need for Methods for the Bacteriological Examination of Crustacea*

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IN recent years the commercial production of cooked crustecea meats, packed in unsealed containers and shipped under refrigeration ready for consumption, has attained an important place among the seafoods industries. While statistics are not available to show over a period of years the actual production of fresh crabmeat handled and shipped as a perishable commodity, it is estimated from the known catch of hard crabs that the approximate pack in the Chesapeake Bay region alone increased from 2,000,000 lb. in 1925 to 5,200,000 lb. in 1931.[1] In that year the production of fresh crabmeat in the United States amounting to 6,779,990 lb., represented about 75 per cent of the total production of all crustacea meats sold in packages as "fresh-cooked."

Fresh crabmeat is produced commercially in 10 states on the Atlantic and Gulf Coasts and in the 3 Pacific Coast states, and in Alaska. It has become a well known article of diet and is in demand for salads, cocktails, soups, and certain cooked dishes. In addition to crabmeat other crustacea meats are produced commercially and are shipped in cooked condition ready for consumption. In the United States and Alaska in 1931 there were produced in a fresh-cooked condition 124,052 lb. of lobster meat, 1,671,455 lb. of cooked and peeled shrimp, and an appreciable, but unknown, quantity of crayfish, or spiny lobster meat,[2] making a grand total of all cooked crustacea meats, including crabmeat, of nearly 9 million lb. This is no insignificant item in the American dietary.

In order to understand why there is any particular need for the development of bacteriological methods for the examination of these products it is only necessary to consider the methods of production, the opportunities for contamination, and the perishable character of the products. In preparing this type of food for the market the crustacea are cooked in retorts or open kettles. Then, after cooling and trimming, the meat is picked out by hand. Grading is based on the part of the body from which the meat is taken, and according to size of the lumps or flakes. After picking and before packing the meat may or may not be washed. The product is then weighed into cans and with no further heat treatment is packed in larger containers with crushed ice for shipment.

Special investigations with crabmeat

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have shown that the meat within the shell of the crab after cooking is sterile or nearly so. From the cooker on to the final container the product is subjected to multiple sources of contamination. Cooling of the crabs, lobsters, or crayfish, may be conducted under conditions which grossly contaminate the exterior of the shells. During picking this contamination may be transferred to the meat. Pickers too frequently are not scrupulously clean in their habits. Pans, knives, work benches, and utensils with which the meats come in contact may not be maintained in clean condition. The products also come in contact with water and ice, frequently of unknown sanitary quality. In some sections where crustacea meats are produced in quantity, toilet facilities and methods of waste disposal are primitive and crude. In some establishments it has been observed that adequate provision is not made to protect the meat from contamination with material from filthy and dangerous sources. Unless constant warfare is waged to prevent it, contamination may occur from flies, rats, and mice. Crab, lobster, and crayfish meats are handled extensively from the time of cooking until the product reaches the consumer, and there is ever present the opportunity for contamination with filth and with pathogenic bacteria. It is not the intention to imply that all crustacea meats, as produced commercially, are unclean or potentially dangerous. It is regrettable that observations in some communities have too often disclosed objectionable conditions and faulty methods, but in such instances vigorous action has been taken to bring about the desired reformation. With the proper sanitary control it is possible and practicable to produce crustacea meats free from objectionable bacteria. Following recent reforms in sanitary procedures we have reason to believe that crustacea meats as now produced commercially are clean and wholesome. There is, however, need for constant bacteriological control.

It is not unreasonable to compare crustacea meats with oysters or clams that are eaten raw. In fact, the comparison might be extended to include milk. All these products offer conditions conducive to the growth of bacteria. All are handled extensively during production and are subject to contamination with pathogenic organisms, and, to some extent they are all consumed in the condition as produced without further cooking. It has been recognized for a long time that in the interest of public health and consumer protection, control or oyster, clam, and milk production involving bacteriological examination has been necessary. Standard methods for the bacteriological examination of milk and oysters have been in existence for a number of years. There is also a need for the development of a bacteriological method to ascertain whether or not fresh-cooked crustacea meats have been produced under sanitary conditions and are fit for consumption.

In its regulatory work in connection with the enforcement of the Federal Food and Drugs Act, the Food and Drug Administration in recent years has accepted the presence of fecal *B. coli* in cooked crabmeat and other cooked crustacea as evidence of filth and potential danger to health. Certain experimental work and extensive experience with these products have demonstrated a correlation between insanitary methods of production and the incidence of fecal *B. coli* in the finished product.

Institution of regulatory control of commerce in crustacea meats was begun

in an attempt to prevent the recurrence of food poisoning cases which had from time to time been reported as due to crabmeat, and to prohibit the distribution of unclean products. There were no methods for bacteriological examination of these products described in the literature. The need for such methods called for an adaptation to crustacea meat of recognized procedures for the detection of *B. coli* in other products. For some time there has been employed in the Food and Drug Administration a method of crustacea meat examination which has been satisfactory. A known amount of meat is weighed aseptically in a wide-mouth sterile bottle. To the meat is added a known amount of sterile water or salt solution, and the mixture is shaken vigorously with sterile glass beads. The resulting suspension then consists of washings of the meat containing the bacteria present on the product. Standard lactose broth is inoculated with decimal dilutions of this suspension and incubated at 37° C. Where positive presumptive tests are obtained the lactose broth cultures are streaked on plates poured with Levine's eosin-methylene blue agar. From the eosin-methylene blue agar plates typical fecal *B. coli* colonies, when present, are transferred to agar slant cultures and are later further identified and classified as to their position in the colon-aerogenes group.

This method has worked satisfactorily in the hands of the various analysts of the Food and Drug Administration in the examination of nearly 3,000 individual packages of fresh-cooked crustacea meats. The results obtained have in general correlated with the known sanitary conditions under which the meats were produced. Since the technic and media already mentioned have been found reasonably satisfactory, we have not attempted to substitute other methods or other media which are sometimes used for the detection of *B. coli* in foodstuffs. It is possible that the substitution for standard lactose broth of some other medium might result in a higher percentage of confirmations of fecal *B. coli*. Also some medium might be selected that would restrict the growth of those bacteria which interfere with the growth of colon organisms. Any of several direct plating methods using a differential medium for distinguishing members of the colon-aerogenes group might be applied to expedite the analysis. It is necessary that any method adopted must be productive of prompt results in showing whether or not fecal *B. coli* are present in crustacea meat suspected of being polluted. The product is produced, shipped, and consumed in a short period of time, and any method applicable for control purposes must be reasonably rapid. Whether the adoption of some method different from that outlined here will further expedite the work and produce equally reliable results is a subject for investigation.

It has been stated that the presence of fecal *B. coli* in crustacea meat has been accepted by the Food and Drug Administration as evidence of filth and potential danger to health. In interpreting the results of bacteriological examination of these products it has not been the practice to attach the same significance to non-fecal and intermediate strains of colon-aerogenes organisms. Just what interpretation is to be placed on the presence of members of the colon-aerogenes group not proven to be fecal in origin is an open question. The presence of such organisms may have more significance in these products, which are sterile as they start on their way through the picking house, than they would have in certain raw products. For the time

being, however, we can assume that colon-aerogenes organisms not strictly fecal in character do not indicate potential danger to health in the use of the product, although their presence may represent an undesirable contamination signifying an unclean condition. We do know that in properly conducted establishments crustacea meats can be, and are being, produced entirely free from *B. coli*. It would seem then that the presence of any fecal *B. coli* in fresh-cooked crustacea meat would constitute evidence of improper handling and filth. Standards and tolerances are always controversial topics. We are making no definite recommendation now, but if standard bacteriological methods are to be developed, some thought must be given to the question of permissible numbers of colon-aerogenes organisms, if any at all are to be permitted, in products of this kind.

In the control exerted over crustacea meat products, it has not been the practice to place a great deal of emphasis on total counts of bacteria. Nevertheless, the total counts of aerobic organisms do have a very definite significance. All the viable bacteria on the finished product are the result of contamination picked up in the preparation of the meat for shipment. Consequently, the total numbers of bacteria present are a direct index of the degree of cleanliness and expedition exercised in handling the product. It has been the procedure to plate dilutions of the suspension obtained as heretofore described using standard nutrient agar with incubation at 37° C. Better media and more appropriate incubation temperatures might be devised for these products. Any standard method developed should not overlook the significance of total counts in ascertaining the fitness or unfitness of crustacea meats for food purposes.

With the growth of the industry producing fresh-cooked crustacea meats various control agencies, both official and nonofficial, have a common interest in helping to produce a clean, sound, and wholesome food. Each of these agencies can, of course, develop a method of examination satisfactory to themselves, and can establish their own standards and tolerances. Such a development of diverse methods and standards of judgment would result only in confusion for the producer, and for those control agencies organized for the protection of public health and human welfare. A uniform procedure and a common basis of judgment are needed.

A statement then as to the need for methods for the bacteriological examination of crustacea can be summarized in a few brief sentences. There is an increasing production and a wide distribution of crustacea meats sold in cooked condition ready for consumption. These products are subject to contamination throughout their preparation, distribution, and sale. The nature of the contamination is such that it carries with it potential danger to the health of the consumer. The technical control of preparation and the legal control of production, distribution, and sale involve bacteriological analyses. For the accomplishment of the greatest good there should be one method of analysis acceptable to and used in common by all agencies having a part in the sanitary control of these products.

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Suggested Laboratory Procedures for Use in Determining the Cause of Food Poisoning*

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ANY consideration of procedures for determining the cause of food poisoning outbreaks must first take account of the various etiological agents concerned in these cases of illness. The term "food poisoning" is a very broad one and the illnesses included under it are caused by a variety of factors. Certain bacteria play a prominent rôle. A number of metallic compounds may produce poisoning. A few foods are inherently poisonous due to the presence of alkaloids or more obscure but perhaps related substances. The phenomenon of food allergy is occasionally encountered. Finally, there are always a number of outbreaks in which no definite causative agent can be ascertained. At times the epidemiological evidence and clinical symptoms may afford a clue to the nature of the causative agent, but at other times this information is of little assistance.

No attempt will be made to deal with chemical procedures since that problem should be referred to those especially qualified. Our chief concern here is the bacteriological examination.

When the bacteriological laboratory is asked to make an examination of suspected food we must have clearly in mind the microörganisms which experience has shown capable of causing food poisonings. At present 3 groups have been definitely implicated, with suspicion directed toward several others. The groups for which definite evidence has been repeatedly obtained are: (1) *Clostridium botulinum*, (2) certain members of the *Salmonella* or paratyphoid group and (3) *Staphylococci*. There have been a few instances in which members of the dystentery group and streptococci appeared to be responsible and a causative rôle has been claimed for *Proteus*.

Our chief concern must be the detection of those types which have been encountered most frequently, though we should not overlook the possibility of finding some other organism which may be significant. The possibilities fall into many different bacterial groups and the organisms concerned present quite different characteristics. It seems worth while to attempt to formulate a procedure which should be effective in detecting any of them, if present, and which should not be so unduly complicated that it could not be applied by the average laboratory.

The following outline is presented, not as a standard method, but rather as a suggested procedure which it may be desirable to modify. Such an out-

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line may have some merit if it assists those unfamiliar with this problem in the examination of suspected foodstuffs which they may be suddenly called upon to make.

LABORATORY PROCEDURE

A. First Examination—

1. Prepare a stained smear (Gram stain) directly from the foodstuff, preferably the liquid portion.

2. With a loopful of the foodstuff * streak in succession 2 agar plates, preferably a meat infusion agar. With another loopful streak 2 more plates of either Endo or eosin-methylene blue agar. Incubate for 18 to 24 hours at 37° C.

3. Inoculate a tube of broth, preferably prepared from meat infusion, with a small amount of the sample. Incubate at 37° C.

If the poisoning is suspected or definitely known to be botulism the following steps should be included:

4. Inoculate each of 3 tubes of ground meat or beef heart medium with approximately a gram or 1 c.c. of the sample. Ground lean beef, beef heart or veal is tubed with the infusion from the meat so that the layer of ground meat occupies about half of the column of the liquid. The final pH should be 7.2 to 7.6.

Immediately after inoculation 2 of the 3 tubes should be heated to 80° C. for 20 minutes to destroy vegetative cells. If an anaerobic jar is not available the 3 tubes should be layered with about 1 c.c. of sterile vaseline to form a seal. Incubation should be at 35° to 37° C.

5. A portion of the sample should also be used to test for the presence of toxin. Inject subcutaneously at least 2 guinea pigs or 2 white mice with a portion of the food. In most cases it will be necessary to centrifuge the sample before injection to get rid of gross contamination. Use 0.5 to 1.0 c.c. of the supernatant fluid for injection. Where abundant toxin formation is suspected and a sufficiently large sample is available, it is desirable to feed portions to 2 guinea pigs.

Should death of any of the animals occur, controls with antitoxin of types A and B should be included. Inject subcutaneously 2 more animals with a protective dose of type A antitoxin (usually 1 c.c. is sufficient) and an additional 2 with type B antitoxin. These 4 animals should then be injected with the foodstuff in the same way as the original 2 which did not receive antitoxin. If the antitoxic sera are not at hand, these controls should be performed as soon as they are available.

B. Subsequent Examinations—

1. Microscopic examination of the stained smear will give an idea of the relative abundance of bacteria in the product and of the morphological types present.

2. Examine the Endo or eosin-methylene blue plates for the presence of colonies resembling those of the paratyphoid, typhoid, or dysentery groups. If suspicious looking colonies are found, fish several to either Russell medium or to fermentation tubes of dextrose, lactose, and sucrose broths. If such colonies are not encountered, the plates should be incubated an additional 24 hours and reëxamined. The identification of suspected intestinal pathogens requires additional procedure and is described in section C.

Examine also the nutrient agar plates and make Gram stains of several representative colonies. Note especially if staphylococcus or streptococcus col-

* If the only sample submitted is an empty jar or can, the interior should be thoroughly washed out with a few c.c. of sterile salt solution or sterile broth. The washings can then be used for the examination.

onies are present in considerable numbers.

3. The purpose of using a tube of broth is to detect by enrichment and subsequent plating any Salmonella, staphylococci, or other types which might have been missed by direct plating. If the steps listed under A2 and B2 have yielded no information of value, streak Endo or eosin-methylene blue plates and nutrient agar plates from this broth culture. The examination of these plates should then proceed as given under item B2.

4 and 5. (If suspected botulism) The condition of the animals which were injected under item A5 will afford preliminary evidence of the presence or absence of botulinum toxin in the food. This should now be supplemented by examination of the meat medium tubes inoculated under item A4.

These tubes should be incubated for at least 3 to 4 days. Note any macroscopic evidence of growth and prepare Gram stains from each tube. Note whether Gram-positive bacilli, with or without subterminal spores, are present. Select one or more tubes for a toxicity test similar to that carried out with the original sample under item A5. The result of this will serve to confirm that secured with the food sample and at times it may be of great value in affording some additional information. In the event of a positive test the meat medium may be used for further purification and isolation of the culture, if this is desired.

C. Checking of Suspected Salmonella or Other Intestinal Types—

Fermentation results similar to those shown in the accompanying outline immediately raise the question whether the organism may be a member of the Salmonella group or one of the dysentery bacilli. Since there are many miscellaneous saprophytes which resemble the intestinal pathogens in these superficial aspects, a somewhat detailed procedure of checking is necessary. When a culture has been selected for further examination a Gram stain should be made to see whether one is dealing with a medium-size, Gram-negative, nonsporulating rod.

Salmonella Group—The members of this group which are most commonly responsible for food poisoning are *S. aertrycke, S. enteritidis,* and *S. cholerae-suis.* If specific agglutinating sera for these types are not immediately available, nevertheless some information

Russell's medium (24 hour reading)	*Fermentation Tubes*			
	dextrose	*lactose*	*sucrose*	
acid and gas in butt, alkaline slant	acid and gas	negative *	negative *	Similar to that produced by Salmonella group.
acid in butt	acid	negative	negative (or occasionally acid)	Similar to Flexner dysentery.
acid in butt	acid	slow acid	slow acid	Similar to Sonne dysentery.

* Incubation should be continued for at least a week or preferably 2 weeks to rule out delayed fermentation of these sugars. Delayed fermentation of lactose or sucrose is *not* typical of the Salmonella group.

can be obtained with sera which are usually at hand. It is suggested that agglutination tests be made with *S. schottmülleri* (paratyphoid B) serum and with *S. enteritidis* serum. While the typical *S. schottmülleri* is rarely if ever associated with food poisoning, nevertheless the schottmülleri serum will cause clumping of *S. aertrycke* and, to some extent, *S. cholerae-suis*. *S. enteritidis* serum is commonly quite specific. Thus the immediate application of these two sera should be useful in determining if the organism in question is one of the three *Salmonella* types most commonly associated with food poisoning.

At the same time, it is desirable that certain additional sugar fermentation tests be made, where the sugars are available. All Salmonella types ferment, with acid and gas production, maltose, rhamnose, mannitol, and sorbitol. Xylose is fermented by all but *S. paratyphi* (paratyphoid A) and arabinose and trehalose by all the types with the exception of *S. cholerae-suis*.

The results of the agglutination tests, together with the cultural characteristics and fermentation tests, will permit a tentative report of the presence of a member of the Salmonella group. The final identification of the culture will involve the application of known specific sera, together with whatever absorption tests may be necessary. The peptone-tartrate medium of Jordan and Harmon[1] will also be helpful in determining the type. Excellent summaries of the characteristics and relationships of members of the Salmonella group have been prepared by Jordan[2] and Savage[3] and should be consulted in connection with the identification.

Dysentery Bacilli—While rarely encountered in cases of typical food poisoning, nevertheless a few outbreaks have been attributed to these organisms. Members of the Flexner and Sonne subgroups appear to be implicated.[4, 5] Here, too, positive identification can be made only after a detailed study of the physiological and serological characters of the culture in question.

Since the Flexner and Sonne types show very little cross-agglutination, it will be necessary to test the agglutination of the culture with both polyvalent Flexner serum and Sonne serum. In biochemical characteristics, it will be recalled that mannitol is fermented with acid production by both Flexner and Sonne bacilli. The chief point of biochemical differentiation is the slow acid production from lactose and sucrose brought about by the Sonne type but not by the Flexner organisms.

EXAMINATION OF FECES

Samples of excreta are often of value, particularly in those instances where the suspected foodstuff has been consumed or destroyed. If fecal specimens are taken, especial endeavor should be made to procure them during the acute stages of illness. It is believed that no detailed laboratory procedure need be given here, since the examination would follow the usual steps employed for isolation of organisms of the enteric group from feces.

EXAMINATION OF NECROPSY MATERIAL

If such material is available following acute gastrointestinal illness which might have been caused by Salmonella or dysentery organisms, cultures can be made from contents of the colon, spleen, and mesenteric lymph nodes. Positive cultures, which are definitely identified as Salmonella or dysentery types, may be of value in determining the cause of the illness. Positive cultures are usually not obtained from the blood, but where a definite Salmonella type has been isolated from the blood

it is often of value when taken in connection with the other findings.

In cases of botulism, toxin can sometimes be demonstrated in blood or in bowel contents by animal injection along with the use of specific antitoxins. It is necessary to centrifuge or filter bowel contents to get rid of the numerous miscellaneous bacteria which are present.

INTERPRETATION OF RESULTS

Since some outbreaks of food poisoning are due to other than bacteriological causes, perhaps the first duty of the bacteriologist is to realize that his part of the examination may at times prove to be fruitless and that he should not feel obligated to attach blame to any organism which happens to be conspicuous.

The laboratory is often asked for proof that the actual organism obtained is in reality the cause of the trouble. Unfortunately, symptoms of typical acute gastrointestinal illness can rarely, if ever, be reproduced in the ordinary laboratory animals by *feeding*. Results obtained by the *injection* of suspected cultures are open to question and should not be advanced as sole proof of an etiological rôle of the organism in question.

However, if a member of the Salmonella group has been isolated from the suspected food, one may rest assured that beyond reasonable doubt he has obtained the causative agent. This conclusion seems justified since these organisms are not ordinarily encountered in foodstuffs and since there is now good evidence that they are a definite cause of food poisoning. In the event that it has been possible to isolate a similar Salmonella type from specimens of feces or from necropsy material, additional confirmation is thereby obtained.

In the case of staphylococci one cannot be so sure of his ground. We cannot claim a causative rôle for all staphylococci and the strains associated with food poisoning outbreaks cannot be distinguished from others by any definite criterion.[6, 7] Moreover, these types may readily gain access to a foodstuff before or during the process of collection and thus a correct interpretation of their presence is much more difficult than in the case of the Salmonella group. Feeding tests with the usual laboratory animals will afford no definite information and in routine laboratory work one cannot hope to repeat the feeding tests with human volunteers[6, 7] that were originally necessary to substantiate the causative rôle of this organism. One can only rely upon the circumstantial evidence afforded by the finding of considerable numbers of staphylococci in the interior of the foodstuff.

In the case of botulism there is fortunately direct evidence in the injection and feeding of animals and the protection afforded by a specific antitoxic serum.

COMMENTS UPON THE GENERAL PROCEDURE

It must be emphasized again that the foregoing procedure is a tentative one which it may be desirable to modify. There will doubtless be considerable difference of opinion as to the different media and methods which should be employed.

The choice of the ground meat medium for detection of *Clostridium botulinum* (item A4 in the outline) will perhaps be disputed. The writer has chosen the meat medium since it is easy to prepare and has given reasonably satisfactory results in his hands. Others may prefer an infusion or a digest broth without the chopped meat.

There is still some difference of opinion as to the most suitable medium for detection of small numbers of botulinus spores. Dubovsky and Meyer [8] reported that a beef-heart-peptic-digest-liver broth of pH 7.2–7.4 gave the most satisfactory results in their detection of botulinus spores in soil. With this medium toxic cultures were recovered when the sample contained from 10 to 100 spores. If there is time for the preparation of such a medium previous to the arrival of the sample, it might well be substituted for the ground meat medium.

In the injection of animals for demonstration of botulinum toxin, the choice of guinea pigs or white mice need not be specified, since the laboratory must often be guided by what happens to be available at the moment. It will be recalled that white mice are very sensitive to toxin on injection (though not when fed [9]) and thus small amounts of toxin may be detected. On the other hand, mice are quite susceptible to miscellaneous infections and also are injured easily during handling. For this reason death of the mice must be interpreted with caution and positive conclusions cannot be drawn unless the results are uniform and are controlled with known antitoxic sera.

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Combating Employee Illness

IN an effort to combat common colds —an illness which not only causes discomfort to its employees but also costs the company approximately $7,800 annually in salaries paid to ill persons—the New York *Daily News* this year is offering its employees free inoculations against this winter scourge.

The medical department of the News Company holds that inoculations against colds, while far from infallible, help appreciably in 50 per cent of the cases.

Personnel records of the company show that last year the newspaper's 2,096 employees suffered 1,114 cases of various kinds of illness. Of these, more than 20 per cent suffered from colds and related diseases. Of all the employees on the payroll in 1932, 28.6 per cent had colds or related disorders at some time during the year.

That means that nearly 600 persons were inconvenienced through this ailment and the company estimates their total salaries while absent came to $7,800. This does not take into consideration the loss due to the lowered vitality many suffer when they return to work.—*System and Business Management,* 63, 1, Jan., 1934.

Reaching the Negro Community*

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THE Negro furnishes one-tenth of the population of the United States, and as such his health problems should be important to public health workers. Three-quarters of these 12 million Negroes still live in southern states and the majority of them in rural areas where there are most often inadequate medical facilities for either white or black.

About 1915 there began the migration of Negroes from the rural areas and small towns to industrial centers. The importance of this shift of colored people is shown in the following changes in the 10 cities now having the largest Negro population:

	1910	*1930*
New York City	91,709	327,706
Chicago, Ill.	44,103	233,903
Philadelphia, Pa.	84,459	219,599
Baltimore, Md.	84,749	142,106
Washington, D. C.	94,446	132,068
New Orleans, La.	89,262	129,632
Detroit, Mich.	5,741	120,066
Birmingham, Ala.	52,505	99,077
Memphis, Tenn.	52,441	96,550
St. Louis, Mo.	43,960	93,580

Such a large and rapid movement, of a group of the population, into new living and working conditions, into crowded, segregated areas of bad housing, left a marked impression on the vital statistics of the people, from which they are now showing signs of recovery.

In the typical industrial city the Negro quarter is along the railroad, as in New Haven, Conn., or along the banks of some dirty stream as in Akron, Ohio. Again, it is in some abandoned section which is being gradually converted from residence to business, as in South Philadelphia. Occasionally, to be sure, a whole great city area, as on the south side of Chicago, or Harlem in New York City, is occupied by Negroes, but such cases are exceptional. The Hill District of Pittsburgh and the East Side in Cincinnati are rather typical instances of conditions to which Negroes are subject. Bound in, as they are, by natural or social barriers, with little opportunity for expansion, overcrowding is a certain result.

Negroes are for the most part unskilled or semi-skilled, low-paid workers, living in houses two or three generations old, which, in a recent survey, are reported to be on an average of only 16 per cent in good repair. The converted kitchenette apartment, now so prevalent in some Negro neighborhoods, in which a home built for one family, becomes the home of many families, constitutes a physical hazard of first importance, with reference to congestion, sanitary conditions, health and morals. There is lack of sunshine, fresh air, cleanliness, play space and normal recreation. There is nearly always a prevalence of influences which tend to destroy.

This concentration of Negroes in compact, segregated areas has generally had the disadvantage, in most cities,

* Read before the Public Health Education Section of the American Public Health Association at the Sixty-second Annual Meeting in Indianapolis, Ind., October 10, 1933.

of allowing to exist a great disparity of health effort between Negro and white communities. Health departments, always without sufficient funds, or personnel, to do the whole job, have concentrated their efforts in white areas where the best showing could be made before influential people, forgetting the social-educational philosophy of Professor John Dewey which says in effect that what the best and wisest wants for himself, that must the community want for all. Health officers should be interested in finding out what exists in the community for the less fortunate; put that information before the public; and secure action favorable to the elimination of these conditions. It is not popular to spend money on Negro health and the Negro is quite unable to finance his own needs. This, coupled with racial prejudice, accounts for the generally demoralized condition of health efforts in colored neighborhoods. This applies equally to official and voluntary agencies.

Many hospitals and clinics refuse to treat colored patients and it is only with great difficulty that even tax supported medical facilities are made available for Negroes, especially in the South. This keeps the average Negro from knowing very much about the use of medical facilities for the treatment or prevention of disease. Having no place to send the Negro for medical care it is easily assumed that there is small need to carry on an active and continuous health educational campaign. This very segregation also makes it relatively easy to correct the situation, because it affords an opportunity for concentrated efforts in health work. It becomes apparent that there is a sociological problem as a part of the health picture, and that a program planned for educating colored people must also be planned for white people to show them that in maintaining their social responsibilities and self-preservation, they must include for the Negro, not merely health education, but participation in medical facilities.

The health officer has an opportunity to do a double duty here. He may not only attack community health conditions, but he may assist in the broader aspects of race relationships. Contemplating such a double program he is likely to hesitate, but he need not, for all the elements of solution, including interracial organizations will be found to assist him.

A little preparation in the psychology of the Negro community will help. The Negro press is a good place to start. It is a large and powerful influence among colored people. There are several national Negro news distributing agencies, one of which has over 100 correspondent Negro newspapers. Interested health officers may gain enough of this preliminary information from either the local Negro press, to be found in almost every community, or by subscribing for one of the Negro weekly newspapers with a national circulation, such as *The Chicago Defender, The Pittsburgh Courier, The New York Amsterdam News, The Baltimore Afro American, The Norfolk Journal and Guide,* or others. *The Crisis* is the monthly organ of The National Association for the Advancement of Colored People. *Opportunity* is a similar monthly publication of The National Urban League. Both of these are published in New York City. All of these publications will reflect Negro opinion.

It may be necessary to write letters, or publish articles. If the word "Negro" is to be used, spell it with a capital N. Negro is a proper noun, and as such should be capitalized as much as Caucasian, Nordic, Asiatic, Indian, or the names of other races.

Negroes have waged an unceasing, and generally successful campaign, with the leading newspapers of the country for this recognition. Colored or black is the correlative of white and does not demand this treatment.

It is well in speech making to make no reference to the race question. Leave out former experiences with colored people, forego any expression of your own lack of prejudice and omit the "darky" story in dialect. Make your talk as you would in any other neighborhood, illustrating it if possible with statistics especially related to the Negro. In every community certain amenities and certain standards arise to plague the uninitiated, and somehow these few points have gained fame among colored people as being the common errors of white speakers. These points may seem unimportant to you, but the fact that they are important to the Negro should be sufficient to cause you to give them consideration.

Having got this far, let us proceed to look for a contact point within the community itself. The Negro community is not unorganized. There will be leaders and pseudo-leaders. There will also be the usual proportion of fools, objectors, politicians, ambitious self-seekers and obstructionists. In this you will unfortunately recognize a normal condition for any community. But there will also be intelligent, earnest, unselfish, racial-minded leadership too. Naturally, it is important to make the right contact. Begin with your Council of Social Agencies which will very likely be able to point out a trained social worker of color who will be an invaluable guide. A list of the available agencies for your assistance will always run into a score or so in number. Last year in Chicago we had about 75 coöperating organizations during our observance of National Negro Health Week. Some of the principal agencies follow.

A Negro medical society which often is made up of the physicians, dentists and pharmacists, combined into one organization. If there is a colored hospital in the community it will of course be of inestimable help. There is great interest in the development of these colored hospitals and, with their out patient, and often social service departments, they are invaluable, especially in follow-up work after a campaign involving physical examinations or treatment. In addition, the following agencies should be sought:

The Colored Press
Colored Public Health Workers, including nurses
Negro Health Week organization
Social Service organizations with qualified, trained, experienced workers in charge, such as,
1. The Urban League
2. The Young Men's Christian Association
3. The Young Women's Christian Association
4. The Community Center
5. Phyllis Wheatley Homes

Negro Business League
Negro Life Insurance Companies with their managers and agents
Churches and Church organizations
Interracial Commission
Fraternal groups
Women's clubs
Study clubs
Political organizations
Neighborhood clubs
Industrial workers' groups
Social clubs
Schools
Parent teacher associations
Boy Scouts
Girl Reserves
Barbers
Beauty shop operators
The neighborhood movie house

These agencies are very much like those to be found in any community and may be used in the same way.

Pioneer work in health education among Negroes has already been done by the National Negro Health Move-

ment, now under the supervision of the U. S. Public Health Service. This organization was founded by Booker T. Washington in 1915, and has developed from an early emphasis on clean-up activities, until today, in the various communities, according to their resources and leadership, it has assumed every phase of health conservation including pageants, keeping-fit methods, athletic contests, periodic health examinations and clinics for treatment. A *Health Week Bulletin* is issued and there is an annual poster contest. This annual observance is usually held in the spring at about the same time as the Early Diagnosis Campaign of the National Tuberculosis Association.

The importance of this movement lies in the fact that it has stimulated and kept alive the interest of colored people in health education. The following figures show the communities participating:

Year	*Communities Participated*
1925	139
1926	326
1927	405
1928	428
1929	464
1930	505

The National Negro Health Week celebration has been an effort coming from within the Negro community itself, financed from within the community, in most instances, and its direction and leadership emanating from the Negro group. Almost always it has the coöperation of the official and volunteer agencies. Of necessity it is often an indifferent job, while again often a very excellent piece of work is done. Official agencies, taking the lead in similar efforts, having improved methods of organization and greater resources could do the job infinitely better, and should.

In Chicago this work has been done in the name of a Health Council, under the leadership of the Cook County Physicians Association, The Lincoln Dental Society, the Wabash Avenue Y.M.C.A. (which are colored organizations), and coöperating agencies. It is always well to get the medical men in early, and taking the lead. The secretary of the Y.M.C.A. is the active executive who pushes the work. A full-time social worker is almost imperative under the circumstances, if his organization will release him for several weeks in order that he may give the time to the immense amount of organization work preliminary to the campaign. Headquarters are maintained at the Y.M.C.A.

A thorough organization is set up with as many committees, and as many people contacted, as possible. This is done, not on the basis that all of them are going to work, but for its advertising value. The actual planning is kept in a small executive committee. Speakers are sent to churches, schools, and other public meetings several weeks in advance of the active campaign. Agents of the colored life insurance companies are called together in a mass meeting and interested in the work. They distribute pamphlets, posters and window cards advertising the meetings and the health examination clinic. They are given appointment cards for examinations to distribute on their debits, and turn these in in advance of the opening of the drive. During the 2 weeks of the campaign an effort is made to reach every church, school, and social gathering with a speaker or motion picture.

The campaign centers about a clinic for periodic health examinations at the Y.M.C.A. Motion pictures on health subjects are kept going for the waiting patients and a fine exhibit of educational posters and mechanical apparatus helps to hold their interest. The Municipal Tuberculosis Sanitarium erects a model fresh air school room and a

model sleeping porch. We use at least 6 examining rooms. Local surgical houses contribute tables, scales, test tubes, sterilizers and what-not for examination purposes. The dental equipment houses contribute 2 dental chairs and equipment for dental examinations. Many national agencies supply literature for distribution. Publicity is given by the white and colored press. In our most successful campaign in 1931, by stimulating the Health Department to examine one high school largely attended by colored students, we were able to count 3,375 babies, children, and adults who had been examined during this drive.

The management of the clinic may be of some interest. Mornings are given over to babies, afternoons to women, and evenings to men. The medical and dental societies adopt schedules for their members who volunteer their services. Each adult visits the clinic twice. On his first visit the patient's history is taken by nurses who give their services. Charts furnished by the American Medical Association are used. A specimen of urine and a blood Wassermann are taken from every applicant for examination. Provident Hospital and the Health Department take care of the laboratory work. These reports are assembled and the patient returns in a week, is examined, and advised according to his physical and laboratory findings. No treatment is given.

Another variant of this, but not so successful, was tried this year, when a complete roster of the medical and dental societies was distributed advising that during the 2 weeks of the campaign these examinations would be given free in any of the members' offices.

The advice given these patients is simple but thorough. They are told of the importance of physical examinations, that they should be repeated each year, that doctors are equipped to make these examinations in their offices, and where impairments are found efforts are made to see that they are corrected.

The matter of awards in such educational work is important. For a number of years we gave cups and medals for the best teeth, the healthiest boy or girl, etc. A far more successful method is a certificate for every person examined. For a time we considered grading them A, B, or C, according to some loose standard of physical fitness. This was decided against and rather impressive certificates were made up like stock certificates and a gold seal placed on them. They are signed by the chairman and secretary of the Health Council and the presidents of the medical and dental societies. One year the Health Commissioner signed them, too. The certificates merely read, " This certifies that John Doe has been examined in the 1933 health examination clinic, thereby showing an interest in his physical condition, and further, he agrees to have such an examination annually. This is a real contribution to racial development."

It is surprising the amount of pride which is taken in these certificates. They are distributed at a final mass meeting and they serve the added purpose of making this meeting a success. Two nurses in white uniforms present them with all the formality of a graduation exercise. They are made out individually and rolled and placed impressively on the stage on two tables and the individuals' names are read out as they come forward. There is an attempt to give dignity and seriousness to this ceremony.

In planning a campaign among colored people you may well make your main objectives tuberculosis, for which the rate is from 2 to 6 times as high as for white; syphilis, for which there is also a high rate, and maternal and infant mortality, the rates for which

are about 2½ times as high as for white mothers and babies.

In so far as the work done by official agencies among Negroes is concerned, the health department of the city of Detroit perhaps has been as successful as any.

In Detroit, the care of the Negro sick has been made largely the responsibility of the Negro doctor, under the direction of the city Health Department. But Detroit has an excellent Health Council in the matter of organization. So have Cleveland, Rochester, and Boston. No city, operating with a health council, surveying its field in preparation for a program, can conscientiously neglect as large a group as makes up the Negro community, ergo, form a health council, if not for the whole city, at least for the Negro community.

The foregoing should make it apparent that there are within the Negro community about the same elements for health educational efforts as are to be found in other communities. It is important to stress this point for two reasons. First, because it dispels any idea that different methods are necessary, and lets us see the problem as being one of similar design and unity. This is very important. Secondly, it also demonstrates that no new or different agencies are necessary to deal with the problem but, instead, it needs merely a broadening of the usual program to include the Negro. Perhaps one of the greatest hindrances to public health work among Negroes is the gradually failing notion that the Negro is biologically different. Often he is thought to be so different, indeed, that the public health worker just stands back and asks the question "What shall I do for the Negro?" and does nothing.

It has well been pointed out that while it might be very interesting to prove that there is a biological difference between whites and Negroes, one could really do nothing about it and it would likely have no effect upon control measures.

The whole problem involves several thousand state, county and municipal health departments. The best way to begin, is to begin. The best answer to the question of what shall I do for Negroes, is to ask the question "What have you done?" It is inconceivable, under any other circumstances, than those associated with race prejudice, that health officers can so complacently review, year after year, the unfavorable vital statistical reports of one-tenth of the population and make no special effort to correct it. In the meantime a magnificent chance for fame stands unaccepted. There is no greater opportunity for brilliant achievement, along all lines of public health work, than exists today in Negro communities. Public opinion can and should be changed. There is a moral responsibility, not being assumed even for the white population, when the black people are neglected. The great voluntary agencies need to stimulate interest in the interracial approach necessary. This is no more impossible, nor any less humanitarian, than the change of public opinion they have wrought in their various specialized fields.

Experienced public health workers attempting to visualize conditions and programs for a colored community should go back to what was accepted as being good 20 years ago and make that the starting point.

It should be realized that the Negro community today has a death rate comparable to that of the white rate of 20 years ago. Even this lagging behind is a great gain over the Negro rate of 30 years ago. Inevitably some effects of the nation-wide improvements in health conditions, though few were specifically directed toward the Negro,

have ameliorated his plight. Similarly, an improved Negro community health will lower the white rate further.

There is evident today a greater willingness than this country has ever known to experiment in social changes, under the inspired leadership of President Franklin Delano Roosevelt. The national administration stands emphatically for equality of wages, under the NRA, regardless of race, or color, despite the widespread inequalities heretofore responsible for so much of the low economic standing of the Negro which in turn contributed to low health standards. This has a certain appositiveness for the most desirable health conditions, and unless health officers plan a New Deal of equality of facilities, they must expect to be charged with plain stupidity.

Participation in these experimentations gives the greatest possible returns to the individuals so fortunately endowed as to be able to take part in the trends of the times. Such effort expended upon the Negro will come back in the form of his creative contributions to American life and in his better citizenship.

Clean Milk and Safe Milk

Clean milk is milk which has been produced and distributed with the minimum amount of extraneous contamination such as manure from the cow's udder and flanks, dust from the cowshed and dairy, and dirt from the milker's hands, utensils, and milk containers. When care is not exercised, such contamination readily occurs and dirty milk results. Dirty milk is not only esthetically objectionable but it also has poor keeping qualities, and for this reason alone reputable firms are anxious to obtain their supplies as clean as possible. Even if the dirt in milk contains no pathogenic organisms, the conditions which lead to dirty milk also favor contamination with any pathogenic organisms which may be in a position to gain access to the milk.

It must be noted, however, that a clean milk is not by any means necessarily a safe milk. Milk obtained from a herd infected with tuberculosis or contagious abortion is never safe, no matter how cleanly it may be produced. Cleanliness of the general milk supply is desirable but cleanliness is not enough.

To insure its safety, that is to say, its freedom from pathogenic organisms, pasteurization is essential.—J. M. Hamill, M.D., *Lancet*, Dec. 30, 1933, p. 1498.

The New City Appraisal Form

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THE newly revised *Appraisal Form for City Health Work* is in the hands of the printer and will be ready for issuance during March. The *Form* in its newest dress represents the evolution of an idea originating with Dr. Charles V. Chapin in 1923. Developed further by Dr. Watson Rankin, then Field Director of the Committee on Municipal Health Department Practice, and by Dr. W. F. Walker, representing the American Child Health Association following its health survey of 86 cities, and tested by a widening experience and critical examination by reviewing committees, section officers of the American Public Health Association, and representatives of national and local health groups, the *Form* now emerges in its fourth edition.

In the words of its sponsors, the *Form* is a compendium of practices and activities which represents a sampling of the main elements of a generally desirable municipal health program. Its purpose is to assist the health officer in planning his program and in evaluating his activities. It provides also a comprehensive picture for those understanding people in a community upon whose support the health service must rely, and yet who have neither the opportunity nor the special knowledge necessary for an independent appraisal.

The *Form*, made up of items which call for volume and kind of activity, is intended as a measuring rod of "the degree to which citizens generally have bestirred themselves to protect and advance their communal health." Contrary perhaps to the news reporter's conception, the *Form* does not pretend to measure the "healthfulness" of a city. The highest scoring city is not necessarily the healthiest city. Cities do not start from the same level of opportunity for health. Their health assets vary widely. It is extremely difficult to measure health. Morbidity and mortality rates do it only partially and crudely. It is activity and performance and balancing of effort within a city's natural limitations that the *Appraisal Form* attempts to measure.

What is new in the new revision?

It is slightly longer. It was inevitable that it would grow with the years. Qualifications have been introduced. Definitions have been sharpened. And this means more space. Better suited items have displaced others. Standards and numerical weightings have been altered, some up, some down.

There are 11 scoring sections in the new form. There were 14 in the old. Two sections—Cancer, and Heart Disease Control—have been combined with other subject matter in a non-scoring section called "Other Disease Activities." One section—"Popular Health Instruction"—has been removed as an independent section and distributed over the other sections. One new non-scoring section has been added, "Mental Hygiene."

The 11 scoring sections with the relative weights for scoring purposes are grouped as follows:

I—Common Services	
A—Vital Statistics	.45
B—Laboratory	.60
II—Preventable Disease Activities	
A—Acute Communicable Diseases	1.55
B—Venereal Diseases	.65
C—Tuberculosis	.90
III—Activities for the Promotion of Hygiene of the Individual	
A—Maternity Hygiene	.90
B—1. Infant Hygiene	.90
2. Preschool Hygiene	.90
C—School Hygiene	1.10
IV—Sanitation Activities	
A—General Sanitation	.80
B—Food and Milk	.75

These weights total 9.50, the remaining .50 being added on condition that the score for each of the 11 sections attains half of its total possible score. This is an idea copied from the *Appraisal Form for Rural Health Work*. It is meant to encourage a balanced as opposed to an unevenly developed program.

Changing sentiment as to the relative importance of sections is reflected in these weightings. The Venereal Disease Section is given increased weighting. So, too, although to a lesser extent, are Maternity, Infant, and Preschool Hygiene. School Hygiene is reduced in the weighting, as well as Vital Statistics and Communicable Disease Control.

In the Laboratory Section more service is called for, certain standards being doubled. For instance, typhoid fever specimens per resident case of typhoid are raised from 7 to 14; diphtheria from 20 to 40.

Milk specimens used to be calculated on the volume of milk distributed. This worked to the disadvantage of cities with a small number of large distributors. Less sampling is necessary in these instances than in the cities with many plants of small size. The basis for sampling is now changed to specimens per month from each milk distributing plant.

The standards of communicable disease reporting have been changed. These are expressed as cases per death. For scarlet fever this used to be 50. It is now 100. Measles is raised from 60 to 120; whooping cough from 25 to 50. On the other hand, typhoid fever is reduced from 10 to 8; diphtheria from 15 to 10.

The old *Form* called for the hospitalization of 50 per cent of the cases of smallpox. The new standard is 25 per cent.

There is a feeling that the standards for visits of infants and preschool children to medical conferences and the visits of nurses to the homes of young children have been a little too ambitious. These have been cut down. Two thousand, instead of 3,000, nursing visits per 1,000 births is the new standard for infants. Nursing visits per infant carried on the register is reduced from 10 to 6. In the Preschool Section, visits to medical health conferences per child registered, are reduced from 4 to 2; home nursing visits per child registered from 4 to 2.

The most radical changes have been made in the section on School Hygiene. The aim throughout has been to emphasize the necessity of real team work among teachers, nurses and school physicians and between parents on the one hand and teachers and nurses on the other. New items have been introduced embodying these principles.

Three new subjects—cross-connections, swimming pools, and housing—appear in the Sanitation Section.

In the Section on Food and Milk Control the most important change relates to the definition of pasteurization. The long standing rule of 142° F. for 30 minutes has been amended so as to recognize other processes as well when officially approved by state and federal officials. This permits the short time high temperature pasteurizing methods which after a number of years of ex-

perience have now been approved by other committees of the American Public Health Association and of the State and Provincial Health Authorities. An item on meat inspection is also included.

The committee, in its work on revision, has tried to keep pace with changing practices and new knowledge, and at the same time avoid unnecessary expansion or complication. To some degree the new items will require a change in local record keeping in order to assemble the material in the form specified. The 5-year interval between revisions is intended to avoid disturbing established routines unnecessarily.

One new feature of the *Form* is an expansion of the preliminary section relating to demographic data. Graphs have been introduced to show the distribution of death rates from specific causes in a wide array of cities. This permits a community to compare its position in these particulars with the general run of cities. A description is also given of the means of adjusting rates to a standard million of population, thus eliminating the artificial differences in rates due to different proportions of the population within age groups.

The new *Form* facilitates the recording of all services of a public health nature, including those performed by private practitioners which have been difficult to obtain heretofore, as well as those of official and voluntary agencies.

The limitations of the *Form* are discussed very frankly in the Introductory Statement. Its standards are based on professional group judgment of the day and on results now being attained in many instances by at least a quarter of the cities whose information is available. It is not expected that a city should modify its activities solely for the purpose of increasing its score when the best judgment of the community is that the local situation dictates otherwise. The *Form* is to be considered as a useful, guiding instrument rather than as an inflexible pattern. Its aim is not to hamper but to help.

The *Form* will be used by the Field Director of the Committee on Administrative Practice when called in by cities for surveys. It will be found useful to health officers particularly in cities having over 25,000 population, and even in smaller cities. It will be extremely helpful to the Committee on Administrative Practice if health officers after scoring their cities will forward a copy of the completed *Form* to the American Public Health Association office. No publication will be made of scores without the permission of the health officer. Information as to the performance of cities with respect to the detailed items will help in keeping the central office acquainted with current practice and will also prove valuable in later revisions.

Membership of Committee includes: Earl G. Brown, M.D., A. Grant Fleming, M.D., Allen W. Freeman, M.D., Theresa Kraker Guthrie, R.N., George D. Lummis, M.D., Frank J. Osborne, L. J. Roper, M.D., John J. Sippy, M.D., Henry F. Vaughan, Dr.P.H., W. F. Walker, Dr.P.H.; representatives from Health Officers Section, Leon Banov, M.D., James Roberts, M.D., H. A. Streeter, M.D., I. F. Thompson, M.D.

Ex-officio, Carl E. Buck, Dr.P.H., Field Director, Committee on Administrative Practice.

Relationship of Shigella Alkalescens to Other Members of the Shigella Group*

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THE organism designated by Andrewes [1] as *B. alkalescens* was considered by him and has been considered since its discovery to be nonpathogenic. Its isolation, even in diseases where no other etiological agent could be demonstrated, has been described generally as of no significance. We feel it is probably because of this, that *Shigella alkalescens* has not received the attention its presence in urine or feces justifies. In our studies of this organism during the past 8 months we have made special efforts to demonstrate it in both normal and abnormal feces and urines. The organism was always found associated with definite disease conditions.

Andrewes [1] was not able to study completely the pathogenicity of his cultures for rabbits. He states: "These experiments, few as they are, suggest that *B. alkalescens* is devoid of pathogenic power and separate it sharply from the Flexner Y group." His experiments showed further that there was no cross-agglutination with Flexner Y sera and indicated that the serological relationship of *B. alkalescens* and *B. dispar* with the Flexner Y group was remote, although he states, "There was a suggestion of some small element in common." Topley and Wilson [2] discuss the *alkalescens* and *dispar* types in the dysentery series because of their etiological relationship to bacillary dysentery considering these organisms closely allied to the dysentery group, although pointing out that the *alkalescens* strains are probably nonpathogenic.

In our studies of the dysentery group we [3, 4] were able to demonstrate a definite relationship of *B. dispar* (*Shigella dispar*) to some members of the Flexner series, and in continuing these studies have been able to demonstrate further a distinct relationship of *Shigella alkalescens* to other members of the dysentery group.

The organisms studied in this series were isolated, some from cases of acute enteric disease and others from cases of unknown etiology. Four cases showed no symptoms of dysentery and in each of these cases the clinical history gave evidence of chronic nephritis. In these latter the organisms were isolated from catheterized urines.

OUTLINE OF CASE REPORTS

Several strains of *Shigella alkalescens* were isolated in an outbreak of dysentery at the Brown University Infirmary, Providence, R. I. This outbreak was the second that had occurred within a few weeks. No bacteriological studies had been made of the first outbreak. In the second, several students and 2 nurses developed symptoms of dysentery,

* Read before the Laboratory Section of the American Public Health Association at the Sixty-second Annual Meeting in Indianapolis, Ind., October 12, 1933.

complaining of abdominal pain and diarrhea. In most instances the disease was acute and of short duration although 1 patient (a nurse) was violently ill with nausea and vomiting.

Diarrhea occurred for several days. The patient was prostrated. She made an uneventful recovery, however, within 2 weeks. The students with similar but less acute symptoms made rather rapid recoveries. The Widal reaction was negative in all patients.

Specimens were taken from all food handlers and cases. From each of the cases and 1 food handler, *Shigella alkalescens* was isolated. No other significant organisms could be demonstrated. Cross-agglutinations with this organism and patients' sera indicated an etiological relationship to the disease. The food handler was relieved from her duties and no further cases developed.

Shigella alkalescens was isolated from 4 other cases each with a clinical diagnosis of nephritis and no intestinal symptoms. In each instance the organism was isolated from a catheterized urine; in pure culture in 3 cases and associated with *Escherichia coli* in 1 case. The Widal reaction was negative in these cases.

After identification of the organisms isolated had been made by means of morphological, biochemical and serological reactions, a group of 6 representative cultures was chosen for further study to determine their relationship to other members of the *Shigella* group.

MORPHOLOGY OF CULTURES STUDIED

Macroscopic—The organisms grew readily on eosin-methylene-blue agar. In 24 hours the colonies measured 0.5 to 3 mm. in diameter. In 48 hours definite blue centers developed indicating a slight precipitation of the dye. The colonies were convex, translucent, entire and glistening. On Russell's triple sugar medium an acid butt and an alkaline slant were produced (Andrade's indicator).

Microscopic—The organism was a Gram-negative, short rod showing cocco-bacillary forms with occasional longer filamentous forms, the latter appearing 1 or 2 per microscopic field. The organism decolorized readily by Gram stain. It was non-motile in 3, 8, and 24 hour broth cultures.

Biochemical Reactions — The biochemical reactions agreed with those given for *Shigella alkalescens* in *Bergey's*[5] *Manual*. Dextrose, maltose, mannite, rhamnose, arabinose, cellobiose, dulcite, xylose and galactose were fermented with the production of acid. Lactose, sucrose, salicin, raffinose and inosite were not affected. In some instances sorbite was fermented but the majority of cultures showed no reaction with this carbohydrate. Litmus milk was neutral or alkaline in reaction. The methyl-red test was positive and the Voges-Proskauer negative. Nitrates were reduced and indol was formed in all instances.

SEROLOGICAL REACTIONS

Agglutination — Two single strain *alkalescens* sera were prepared by injecting killed cultures into rabbits, free of natural agglutinins for organisms of the dysentery group, in increasing doses every other day for a period of 10 injections. The cultures used for preparation of these sera are numbered 6,586 and 89,875. The macroscopic tube test was used. Dilutions in isotonic salt solution (0.85 per cent) were made ranging from 1:20 to 1:5,120. The turbidity of all antigens was made to correspond to a Gates[6] reading of 7.8 to 8. The total volume in each tube was 1 ml. The tests were placed in a water bath at 56° C. for 4 hours followed by refrigeration overnight.

The 5 *alkalescens* strains, 4 *Shigella paradysenteriae* strains (Harris, Hiss, Strong, and Army), and 1 strain each of *Shigella dysenteriae* (*Shiga*), *Shigella dispar*, and *Shigella paradysenteriae Sonne* were agglutinated with the 2 *alkalescens* sera. The results are given in Table I. It will be noted that except for culture 13,619 there is good agreement in degree of agglutination among

TABLE I

SEROLOGICAL RELATIONSHIP OF SHIGELLA ALKALESCENS TO SHIGELLA PARADYSENTERIAE HARRIS, HISS, STRONG, ARMY, SONNE, SHIGELLA DYSENTERIAE AND SHIGELLA DISPAR

CULTURE	Shigella Alkalescens Single Strain Sera	DILUTION OF SERUM									
		20	40	80	160	320	640	1280	2560	5120	C
13619 Alkalescens	89875	++++	++++	+++	+	±	0	0	0	0	0
	6586	++	±	±	0	0	0	0	0	0	0
20218 "	89875	++++	++++	++++	+++	++	+	±	0	0	0
	6586	++++	++++	++++	++++	+++	+++	+	0	0	0
19703 "	89887	+++	+++	+++	++	+	±	0	0	0	0
	6586	++++	++++	++++	++++	+++	+++	+	±	0	0
89875 "	89875*	++++	++++	+++	+++	++	±	±	±	±	0
	6586	++++	++++	++++	+++	+++	+++	++	+	0	0
6586 "	89875	+++	++	++	+	+	±	0	0	0	0
	6586*	++++	++++	++++	++++	+++	++	++	++	+	0
Harris	89875	++	++	±	±	0	0	0	0	0	0
	6586	++	++	+	+	±	0	0	0	0	0
Hiss	89875	±	0	0	0	0	0	0	0	0	0
	6586	++++	+++	++	±	0	0	0	0	0	0
Strong	89875	±	+++	+++	+++	++	±	0	0	0	0
	6586	++++	++++	++++	+++	++	0	0	0	0	0
Army	89875	±	±	0	0	0	0	0	0	0	0
	6586	+++	++	±	0	0	0	0	0	0	0
Shiga	89875	+	++	++	+	±	±	0	0	0	0
	6586	+++	+++	+++	++	±	±	0	0	0	0
Sonne	89875	++++	++++	+	+	0	0	0	0	0	0
	6586	++++	+++	++	0	0	0	0	0	0	0
Dispar	89875	+++	+++	+++	±	0	0	0	0	0	0
	6586	++++	++++	++	0	0	0	0	0	0	0

* Titer with Homologous Organism.

the 5 strains of *Shigella alkalescens*. It will be noted further that the *Shigella paradysenteriae* strains (Harris, Hiss, Strong, and Army), as well as the Shiga, dispar, and Sonne strains, show agglutination with both the *alkalescens* sera, the weakest of these reactions occurring with the Hiss and Army strains and the *alkalescens* serum 89,875. Although the agglutination was not high in titer in any instance, on repeated tests similar, consistent results were obtained. Except for a slight agglutination with our *alkalescens* strain 13,619 and a commercial Shiga serum, attempts to demonstrate cross-agglutination of our *alkalescens* strains with Sonne, dispar, and Shiga sera were not successful. This interesting phenomenon had been noted in a previous investigation [4] in which it was demonstrated that, although a Flexner (Strong) strain produced a good agglutinin for a *dispar* strain, the *dispar* organism did not produce an agglutinin for the Strong strain.

In order to determine whether there was a cross-agglutination between *Shigella alkalescens* and *Eberthella typhi*, the 5 *alkalescens* strains (6,586, 13,619, 19,703, 20,218 and 89,875) were agglutinated with 4 *Eberthella typhi* sera (Michigan, Connecticut, New York 'O' sera, and Allen). Further, 3 *Eberthella typhi* strains (Connecticut, Albany (Bender), and Michigan) were agglutinated in the 2 prepared *Shigella alkalescens* sera (6,586 and 89,875). In no instance could we demonstrate definite agglutination.

Agglutinin Absorption—Using the 2 *alkalescens* sera available (6,586 and 89,875), agglutinin absorption tests

were made with the Harris, Hiss, Strong, Army, and Shiga strains. The agglutinating serum was diluted 1:10 and 6 ml. added to a 24-hour agar slant culture of the organism under study. (Our usual method calls for an original dilution of 1:50 but due to low titers it seemed advisable to use a lower dilution.) With a platinum needle, the suspension was carefully emulsified in the serum. A small pledget of sterile absorbent cotton was dropped into the test tube and the suspension drawn up into a pipette. The cotton acted as a filter for gross particles. The suspension was pipetted directly to a sterile centrifuge tube, incubated in a water bath at 37° C. for 2 hours and then centrifugalized at high speed for 1 hour. The supernatant fluid was then pipetted under sterile conditions onto a second 24-hour slant and the procedure repeated. The procedure was then repeated on a third slant. (This third suspension may be placed in the refrigerator over night rather than incubated at 37° C. for 2 hours with equally good results.) The absorption that took place with homologous organisms was complete in every instance.

After absorption, the organisms used were agglutinated in each of the sera (6,586 and 89,875) as a control of the method and also agglutinated with the 2 *alkalescens* stains to determine the loss in titer. Controls using unabsorbed

TABLE II

EFFECT OF ABSORPTION OF SHIGELLA ALKALESCENS SERA WITH FLEXNER AND SHIGA STRAINS

CULTURE USED FOR ABSORPTION	SERA		AGGLUTINATION IN GIVEN DILUTION								
			20	40	80	160	320	640	1280	2560	C
Harris	Unabsorbed Alkalescens Diagnostic Sera	6586	++++	++++	+++	+	±	0	0	0	0
		89875	++	++	±	0	0	0	0	0	0
Hiss		6586	++++	++	±	0	0	0	0	0	0
		89875	+	±	0	0	0	0	0	0	0
Strong		6586	++++	++++	+++	+	0	0	0	0	0
		89875	+++	+++	++	+	0	0	0	0	0
Army		6586	++	++	±	0	0	0	0	0	0
		89875	+	±	0	0	0	0	0	0	0
Shiga		6586	++	++	++	±	0	0	0	0	0
		89875	+++	+++	++	++	±	0	0	0	0
*6586 *89875		6586	++++	++++	++++	++++	++++	+++	++	+	0
		89875	++++	++++	++++	++++	+++	++	+	±	0
Harris Hiss Strong Army Shiga 6586 and 89875	Absorbed Alkalescens Diagnostic Sera Tested With Homologous Organisms	6586	0	0	0	0	0	0	0	0	0
		89875	0	0	0	0	0	0	0	0	0
Harris	Same Absorbed Alkalescens Sera Tested with Alkalescens Strains 6586 and 89875	6586	++++	++++	++	++	0	0	0	0	0
		89875	+++	+++	+++	++	±	0	0	0	0
Hiss		6586	++++	++++	+++	++	±	0	0	0	0
		89875	++++	++++	+++	++	±	0	0	0	0
Strong		6586	++++	+++	++	++	0	0	0	0	0
		89875	++++	++++	+++	++	+	0	0	0	0
Army		6586	++++	++++	+++	++	±	0	0	0	0
		89875	+++	+++	++	++	+	0	0	0	0
Shiga		6586	++++	++++	++	+	0	0	0	0	0
		89875	++++	+++	++	+	+	0	0	0	0

* Homologous Organism.

sera and each of the Flexner and Shiga strains were made (Table II). It will be seen from an examination of the table, first, that there is with unabsorbed sera definite agglutination with the Harris, Hiss, Strong, Army, and Shiga strains; second, that the absorption of *alkalescens* sera with the above strains removes all agglutinins for these strains; third, that there is a comparable reduction in titer of the absorbed sera when the homologous organisms (6,586 and 89,875) are agglutinated with these sera.

STUDIES WITH SHWARTZMAN REACTION

In order to determine further the relationship of *Shigella alkalescens* to other members of the dysentery group it seemed advisable to attempt to show this relationship by means of the Shwartzman [7] reaction. In a previous communication one of us with Ecker [8] demonstrated a group specificity with this phenomenon under the proper conditions of experimentation, and it was felt that a similar result might be obtained with members of the dysentery group.

METHODS

Five strains of the dysentery group (Harris, Hiss, Strong, Army, and Shiga) and 5 of *Shigella alkalescens* (13619, 89875, 6586, 20218 and 19703) were grown for 48 hours in a meat-infusion broth. The broth cultures were then filtered through Berkefeld N candles. Preliminary experiments were made to determine the potency of each filtrate and, although it was possible to demonstrate a Shwartzman reaction in each case, it seemed advisable to concentrate the filtrates to obtain more active and uniform toxins. Accordingly, the 10 filtrates were concentrated *in vacuo* at 40° to 50° to one-seventh their original volume. The concentrated filtrates were then put in 10 c.c. dark brown, glass ampoules and heated at 60° C. for 1 hour for sterilization.

The sides of 10 large white rabbits were depilated by using a mixture of barium sulphide, corn starch, and zinc oxide. The area from which the hair was removed was sufficiently large to allow space for 10 intracutaneous injections. The 10 concentrated filtrates were injected intracutaneously in 0.25 ml. amounts in a definite sequence in all 10 rabbits (total of 100 injections). Twenty-four hours later each rabbit was injected with one of the filtrates intravenously.

RESULTS

The results obtained are summarized in Table III. In each instance the intracutaneous injections alone brought about red, edematous areas (due probably to concentration of the filtrates, since unconcentrated filtrates did not cause definite reactions). Within 3 to 5 hours after the intravenous injection large, black, hemorrhagic areas developed at the site of the previous intracutaneous tests where the skin preparatory factors had sufficiently sensitized the skin. An examination of Table III indicates that the 5 *Shigella alkalescens* filtrates are of higher potency than those of the Flexner or Shiga strains. The potency is exemplified in both skin preparatory factors and in reaction factors—in the former (skin preparatory factors) because the *alkalescens* concentrated filtrates sensitized the skin not only to the homologous filtrates but also to heterologous (Flexner and Shiga) filtrates (Table III upper and lower left quadrants); in the latter (reaction factors) because the intravenous injection of the 5 *alkalescens* filtrates caused more reactions to occur in the skin with homologous as well as heterologous filtrates than did the Flexner and Shiga strains (upper left and upper right quadrants compared to lower left and lower right quadrants). The fact that *alkalescens* filtrates will sensitize the skin of rabbits to intravenous injections of Flexner and Shiga filtrates is at least indicative of a relationship of these strains.

NEUTRALIZATION EXPERIMENTS

In an attempt to produce *Shigella alkalescens* anti-filtrate sera, 5 rabbits

TABLE III

RELATIONSHIP OF SHIGELLA ALKALESCENS TO OTHER MEMBERS OF THE DYSENTERY GROUP AS DEMONSTRATED BY THE SHWARTZMAN REACTION

INTRAVENOUS INJECTIONS	AMOUNT	INTRACUTANEOUS INJECTIONS 0.25 ML.									
		20218	6586	19703	89875	13619	Harris	Hiss	Strong	Army	Shiga
20218	5 Ml.	+	+	+	+	+	+	+	+	+	0
6586	5 Ml.	±	±	+	+	+	+	0	0	0	0
19703	3 Ml.	+	+	+	+	+	0	±	+	0	0
89875	4 Ml.	+	+	+	+	+	0	+	0	+	0
13619	5 Ml.	+	+	+	+	+	+	±	0	0	0
Harris	5 Ml.	+	+	+	+	+	0	+	+	0	0
Hiss	5 Ml.	±	±	+	+	+	0	0	0	0	0
Strong	5 Ml.	+	+	+	+	+	0	0	0	0	0
Army	5 Ml.	+	+	+	+	+	+	+	+	+	0
Shiga	5 Ml.	±	+	+	±	0	0	0	0	0	0

NOTE: A + reaction indicates that the wheal following the second or intravenous injection was at least 10 mm. in diamater; that there was definite hemorrhage and induration at the point of the previous intracutaneous test. A ± reaction indicates an increased reaction over the original intracutaneous test. A negative [0] reaction indicates no change.

were injected over a period of 1 month, every 3 days, with increasing amounts of the 5 unconcentrated *alkalescens* filtrates. In no instance were we able to develop successfully anti-filtrate serum in rabbits inasmuch as neutralization experiments, using the absence of a Shwartzman reaction as an index, as well as attempts to show neutralization of the toxic effect of the filtrates in mice were unsuccessful. After these experiments were completed, however, our attention was called by Shwartzman to the fact that it is practically impossible even in a much larger series of rabits to produce anti-filtrate sera (personal communication).

Through the courtesy of Dr. Shwartzman we were able to obtain 100 ml. of Shiga anti-filtrate horse serum. With this attempts were then made to demonstrate a neutralizing effect of the *alkalescens* filtrates both in rabbits and in mice.

METHODS

A series of rabbits was injected with the Shiga filtrate in varying dilutions to determine the smallest amount that would produce a Shwartzman reaction when the concentrated filtrate was used to prepare the skin. It was found that the Shiga filtrate gave only a slightly positive reaction when diluted 1:64 in isotonic (0.85 per cent) salt solution (4 ml. were injected).

A similar series was used for each of the 5 *alkalescens* filtrates. A dilution just slightly stronger than that producing a positive Shwartzman was injected in these neutralization experiments. Two rabbits were used for each filtrate. The Shiga anti-filtrate serum was mixed with each of the filtrates in 2 different amounts (0.2 ml. and 1.0 ml.) and incubated at 37° C. for 1 hour before injection.

For the mice experiments 3 filtrates were used; 89875, 6586 and 19703. The m.l.d. for each of these filtrates was 0.5 ml. In the neutralization experiments 0.7 ml. of each filtrate was injected. Four control mice were used for each filtrate. The serum was added in 0.2 ml., 0.3 ml., 0.4 ml., and 0.5 ml. amounts to 0.7 ml. of the filtrates and incubated for 1 hour at 37° C. before injection. The injections were made intraperitoneally.

RESULTS

From an examination of Table IV it will be noted that definite and complete neutralization of 3 of the 6 *alkalescens* filtrates (13,619, 6,586 and 89,875) was demonstrated by means of 1 ml. of the Shiga anti-filtrate horse serum. A partial but definite reduction in intensity of the Shwartzman reaction was demonstrated in the other 2 *alkalescens* filtrates (19,703 and 20,218) as well as with the Shiga filtrate. The 3 *alkalescens* filtrates that were neutralized with 1.0 ml. of Shiga anti-filtrate serum showed complete neutralization even though the Shiga filtrate itself was only partially neutralized with the same amount of serum. This, however, was probably due to variations in the resistance of animals and toxicity of the filtrates. It will be noted that in no instance was 0.2 ml. of serum sufficient to completely neutralize 4.0 ml. of the dilute filtrates, although there was a partial reduction in intensity of the Shwartzman reaction The neutralization of the toxic effect of the 3 *alkalescens* filtrates used, when injected intraperitoneally into mice with Shiga anti-filtrate horse serum, was clear-cut (see Table V). Of the 12 control mice (4 for each filtrate) each receiving 0.5 ml. (lethal dose) only 1 survived. The addition of as little as 0.2 ml. of Shiga antifiltrate serum proved sufficient to prevent death of the mice with the 3 filtrates used.

DISCUSSION

It is probable that, under the proper conditions any organism may become pathogenic for man. Throughout the literature where reference is made to

TABLE IV

NEUTRALIZING EFFECT OF SHIGA ANTI-FILTRATE HORSE SERUM ON SHIGELLA ALKALESCENS FILTRATES IN RABBITS

Rabbit Number	Filtrate Diluted 1:50	Intracutaneous Injection	Reaction Area of Wheal	Intravenous Injection	Amount of Serum	RESULT
576	13619	0.25Ml	2.5Cm Red Edematous	4Ml	1.0Ml	−2.5 to 3 Cm Red Edematous
595	"	"	2.2 " " "	"	0.2 "	+2.2 to 2.5 " Indurated Hemorrhage
233	19703	"	1.5 " " "	"	1.0 "	±1.5 to 2.0 " Edematous Slight Hemorrhage
596	"	"	2.0 " " "	"	0.2 "	++2.5 to 3.0 " Indurated Hemorrhage
588	20218	"	2.0 " " "	"	1.0 "	+2.5 to 3.0 " Slight Hemorrhage
248	"	"	2.2 " " "	"	0.2 "	++2.0 to 2.5 " Indurated Hemorrhage
586	6586	"	2.2 " " Indurated	"	1.0 "	−2.0 to 2.2 " Edematous Red
584	"	"	1.5 " " Edematous	"	0.2 "	++1.5 to 2.5 " Indurated Hemorrhage
583	89875	"	1.5 " " "	"	1.0 "	−1.5 to 2.0 " Edematous Red
238	"	"	2.3 " " Indurated	"	0.2 "	++++1.5 to 2.5 " Indurated Hemorrhage
578	Shiga	"	Slight Red	"	1.0 "	+2.5 to 2.8 " Indurated Slight Hemorrhage
240	"	"	2.0Cm Red Edematous	"	0.2 "	++++2.5 to 3.0 " Indurated Hemorrhage

−, Shwartzman negative.
+, ++, +++, ++++, Shwartzman positive——Hemorrhage and induration.

TABLE V

NEUTRALIZING EFFECT OF SHIGA ANTI-FILTRATE HORSE SERUM ON ALKALESCENS FILTRATES IN MICE

Filtrate Diluted 1:10	Filtrate Injected	Serum Injected	Mouse Number	Results	Remarks
89875	0.5 Ml	0	A	Dead	Control
	0.5 "	0	B	"	"
	0.5 "	0	C	"	"
	0.5 "	0	D	"	"
	0.7 "	0.2 ml.	E	Survived	Test
	0.7 "	0.3 "	F	"	"
	0.7 "	0.4 "	G	"	"
	0.7 "	0.5 "	H	"	"
6586	0.5 "	0	I	Dead	Control
	0.5 "	0	J	"	"
	0.5 "	0	K	"	"
	0.5 "	0	*L	Survived	"
	0.7 "	0.2 ml.	M	"	Test
	0.7 "	0.3 "	N	"	"
	0.7 "	0.4 "	O	"	"
	0.7 "	0.5 "	P	"	"
19703	0.5 "	0	Q	Dead	Control
	0.5 "	0	R	"	"
	0.5 "	0	S	"	"
	0.5 "	0	T	"	"
	0.7 "	0.2 ml.	U	Survived	Test
	0.7 "	0.3 "	V	"	"
	0.7 "	0.4 "	W	"	"
	0.7 "	0.5 "	X	"	"

* One out of twelve control mice survived.

Shigella alkalescens we find this organism listed as "not pathogenic." The only reference to actual attempts to demonstrate this non-pathogenicity were made by Andrewes [1] who notes that only a few animals were used for this work. The authors could find no reference to isolation of this organism from known cases of dysentery-like diseases.

In previous isolations of *Shigella alkalescens* from cases of enteric and other diseases, particularly chronic nephritis, we paid little attention to it, considering it of no etiological significance. We found however in a careful study of such cases that in spite of definite symptoms of infection no other organism could be demonstrated to account for these symptoms.

When an outbreak of dysentery occurred in a university infirmary (reported in another section of this paper) and *Shigella alkalescens* was isolated repeatedly not only from the stools of the cases but also from an apparently healthy food handler, it appeared that we had definite indication of the pathogenicity of this organism for man. After a period of time the individuals ill with dysentery showed definite agglutinins in their blood

stream for *Shigella alkalescens*. On removal of the food handler involved no further cases developed. These findings indicated the etiological relationship of this organism to these cases.

Four additional cases are reported which were clinically diagnosed as chronic nephritis. There were no symptoms of dysentery. *Shigella alkalescens* was isolated from each. No other significant organism could be demonstrated either in catheterized urines or in stools.

From a study of the morphological characteristics of the *Shigella alkalescens* strains we found very little either in colonial or microscopic appearance that would separate them from those organisms in the dysentery group described as pathogens. In some instances there was a tendency for the colonies to show a blue pigment on eosin-methylene-blue agar after 48 hours. On the other hand, we find this to be true of some of the dysentery strains, particularly *Shigella paradysenteriae* Sonne, which the authors have reported elsewhere.

The biochemical reactions of *Shigella alkalescens* were constant over a period of 6 months and showed sufficient differences to separate it from the true Flexner and Shiga types. In our studies the production of an acid reaction by this organism in dulcite and rhamnose and the tendency to give an alkaline reaction in litmus milk seemed sufficient to distinguish it from the other members of the *Shigella* group.

By agglutination and agglutinin absorption we were able to demonstrate a definite relationship of *Shigella alkalescens* to some members of the dysentery group (*i.e.* Harris, Hiss, Strong, Army and Shiga types) and, although this relationship is not as strong as that demonstrated previously for *Shigella dispar*, the consistency of our results on repeated trials appears sufficient to demonstrate that a relationship exists.

The use of the Shwartzman reaction for demonstrating the relationship of organisms within a given group, such as the intestinal group, was demonstrated by one of us with Ecker [8] in an earlier publication. We were able to show when the skin of rabbits was prepared with filtrates of intestinal bacteria such as *Escherichia coli, Salmonella schottmülleri, Salmonella enteritidis* and others that it was not possible to elicit the Shwartzman reaction by means of organisms such as the enterococcus. Since that time, however, Shwartzman [9] has shown that it is possible to prepare the skin of rabbits with *Eberthella typhi* filtrates of high skin-preparatory potency and to elicit the reaction by means of an intravenous injection of pneumococcus filtrates. These pneumococcus filtrates had no skin-preparatory potency; *i.e.*, they were incapable of sensitizing the skin of rabbits, although possessing definite reacting potency; *i.e.*, an intravenous injection of pneumococcus filtrate would elicit a Shwartzman reaction provided the skin was prepared with a filtrate containing a high concentration of skin-preparatory factors. The fact that heterologous filtrates are capable of eliciting the Shwartzman reaction would necessarily be contraindicative of the specificity of the reaction. However, where it has been demonstrated that heterologous filtrates have been used successfully, the filtrate used in sensitizing the skin had a high concentration of skin-preparatory substances. A similar result is not possible with the ordinary filtrate.

All filtrates used in this investigation were prepared under the same conditions and concentrated as nearly as possible to the same volume *in vacuo*. Each filtrate except that of the Shiga type was shown to contain both skin-preparatory and reacting factors (Shiga

filtrate showed reacting factors only). Under these circumstances and in view of the results obtained where it was shown that various alkalescens filtrates would prepare the skin of rabbits for intravenous doses of Flexner and Shiga strains, it appears that these findings are indicative at least of a group relationship.

The results obtained in the attempts to neutralize the toxic effect of the alkalescens filtrates with Shiga antifiltrate horse serum further augment our findings. These experiments show definitely that Shiga antifiltrate serum under the proper conditions of experimentation will neutralize the effects of the second or intravenous injections of alkalescens filtrates in the Shwartzman test in rabbits and further that the lethal action of these filtrates on mice can be destroyed by the addition, in the proper concentrations, of Shiga anti-filtrate serum.

SUMMARY AND CONCLUSIONS

1. Cases of dysentery-like diseases and others apparently caused by *Shigella alkalescens* are reported.

2. The relationship of *Shigella alkalescens* to other members of the dysentery group is demonstrated by means of agglutination, agglutinin absorption and the Shwartzman phenomenon.

3. Shiga anti-filtrate horse serum neutralizes in rabbits and mice the toxic effect of *Shigella alkalescens* filtrates.

4. This investigation indicates that *Shigella alkalescens* should be included among those organisms in the Shigella group capable of causing disease in man.

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Examination of Fermented Foods by Laboratory Methods*

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THE studies of the last few years, in which a number of samples of sauerkraut have been examined, have shown that a better inspection control of fermented foods is desirable. Although this work has dealt primarily with sauerkraut, it is believed that many of the conditions observed hold true for other fermented foods, such as pickles and olives, as well as relishes prepared from various fermented vegetables; but results of definite laboratory analyses of these products have either never been published, or methods for examination have not been developed. Vinegar might be included in a broad discussion of fermented products, but methods of examination as well as regulations are quite well standardized for this product. The fermented foods here discussed include only those products that result from a lactic acid fermentation, thereby excluding vinegar, as well as beers, wines, etc.

In a report on the quality of commercial sauerkraut,[1] 8 per cent of the samples analyzed were described as unsatisfactory, while 14 per cent were described as of poor quality. This does not indicate that anyone consuming such food is in danger of suffering from poisoning, for it is known that the growth of organisms causing food poisonings does not normally occur during the lactic acid fermentation. Rather, the control of this foodstuff should be considered from the standpoint of decency in packing an edible product and of protecting the consumer against fraud. Fortunately, many fermented products, such as pickles and olives, used as condiments, are packed in glass so that the consumer may see what is purchased. Sauerkraut, on the other hand, since it is inexpensive, is usually sold in cans or in bulk. Because of this and of the fact that more is known about methods of analyzing this product, the discussion will be confined to sauerkraut.

Sauerkraut is not even mentioned in some books on foods and their adulteration. Dr. W. B. White (Chief of Food Control of the U. S. Food and Drug Administration) in referring to sauerkraut in a letter states: "We have never been able to develop methods to substantiate organoleptic evidence of decomposition." In the various seizures by the Government under the Food and Drugs Act, of which there have been few, the sauerkraut has usually been described in the legal complaint as containing decomposed material.

Regulations specify that sauerkraut shall be

> . . . the clean, sound product of characteristic flavor obtained by full fermentation, chiefly lactic, of properly prepared and shredded cabbage in the presence of not less than 2 per cent nor more than 3 per cent of salt. It contains, upon completion of the

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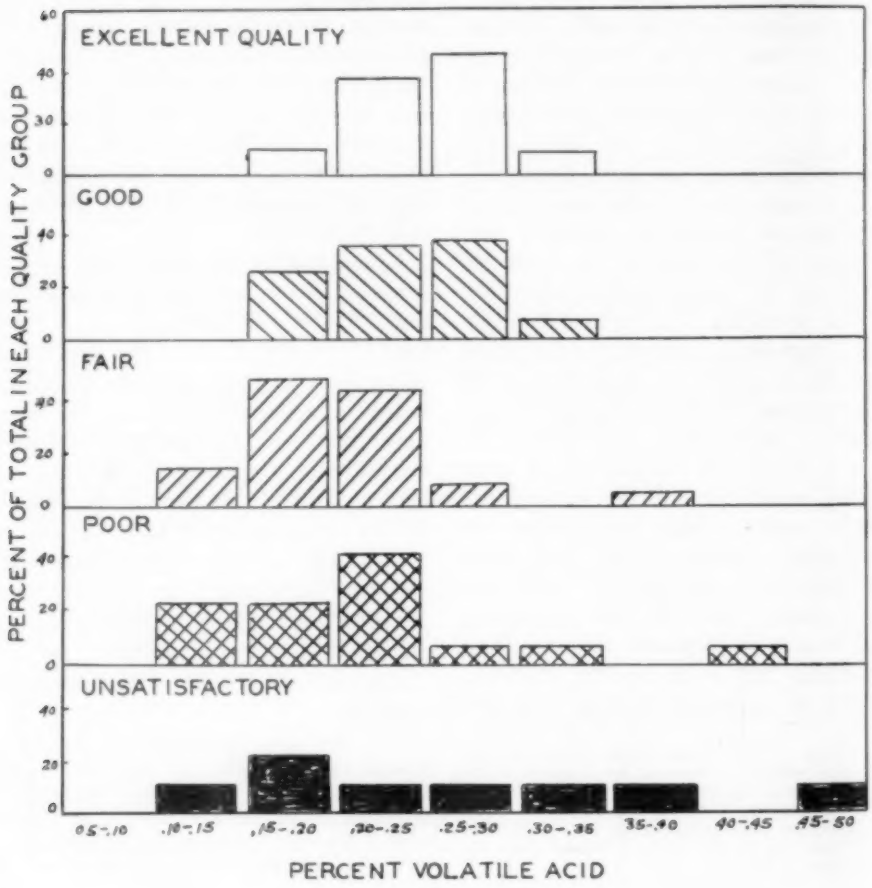
fermentation, not less than 1½ per cent of acid expressed as lactic acid. Sauerkraut which has been rebrined in the process of canning contains not less than 1 per cent of acid.

In the analysis of over 100 samples of kraut obtained from more than 70 different packers throughout the United States, at least one-third were found by direct analyses not to conform to the above definition. It is true that this does not necessarily mean that a third of the pack was poor, since observation has shown that the kraut from the big producing sections, on the whole, is quite superior to that from sections where the industry is not so well developed. However, there are individual companies in all sections that are careless in the preparation of their pack.

Some of the cans of kraut examined in this series of analyses were really unfit for consumption. The astonishing thing is that some canners would think of packing products that are unfit for consumption. Two samples were as green as spinach; others were pink. Some had a definitely unpleasant odor and flavor caused by secondary fermentations. One sample had a fishy flavor, and a few resembled rotten rather than fermented cabbage. The

FIGURE I

The relationship of quality to volatile acid content as found by analysis of 102 samples of canned kraut.



analyses of a few of these may be interesting.

These analyses have been based on research methods, but it is believed that they might be developed into routine control procedures. Salt was determined by direct titrations with silver nitrate, using potassium chromate as indicator; total acid by direct titration with phenolphthalein as indicator; volatile acid by steam distillation; nonvolatile acid by difference; and alcohol by distillation from an alkaline solution, its oxidation to acetic acid by bichromate and steam distillation to secure the volatile acid. A supplemental microscopic examination of the juice for yeasts is often helpful if secondary fermentations are suspected.

Certain comments may be made before going further. The direct titration of salt is far more accurate than any method of sampling, it having proved to be very difficult to get a representative sample for salt determinations from vats of sauerkraut. The results secured by direct titration for total acid are from 0.1 to 0.2 per cent below the actual content of acid as obtained by extraction methods. The determination of the amount of volatile acid depends upon the acidity of the juice and the amount of steam distillate collected. In the analyses made, the juice was not acidified by addition of mineral acid, and 1,600 c.c. of distillate was collected from 500 c.c. of sauerkraut juice. Adding sulphuric acid increases slightly the amount of acid distilled over. Since lactic acid is slightly volatile, increasing the amount of distillate increases the apparent volatile acid. The alcoholic determination is fairly accurate, although in canned krauts the alcohol may have been partially volatilized before canning was completed.

These determinations are at times significant in relating the quality of canned as well as bulk kraut to the fermentation and packing. In other words, the interpretation of the results of these analyses may be made in such a way as to reveal some of the past history of the kraut. It has been shown that in a normal fermentation of sauerkraut, a definite sequence of growth of various types of organisms takes place. The first few days of active fermentation is carried on by a group of acid and gas producing cocci, *Leuconostoc mesenteroides* Van Tieghem. They produce volatile acid, carbon dioxide, and alcohol, as well as lactic acid, and are partly responsible for the flavor of kraut. The fermentation is completed by the lactic acid producing rod *Lactobacillus cucumeris* Bergey *et al.*, and the acid and gas producing rod *Lactobacillus pentoaceticus* Fred, Peterson and Davenport. The part each of these plays in the fermentation is influenced by the amount of salt present as well as the temperature of fermentation. Using the above method of analysis, canned kraut which had been fermented normally, and properly canned, will reveal an alcohol content of from 0.1 to 0.3 per cent and a volatile acid content of from 0.2 to 0.32 per cent.

A few results are given to illustrate the way in which analyses may be interpreted (Table I).

The total acid (3rd column) is an indication of the degree of fermentation. Partially fermented kraut (*e.g.*, No. 50) shows a low total acid content, and may be slightly bitter. On the other hand, fully fermented kraut may be diluted to such an extent in canning (*e.g.*, Brand No. 93, Table I) that the acid is low. But in this case, the salt, volatile acid, and alcohol content are also diluted and therefore yield low values.

The quantity of salt originally present has a direct bearing on the texture.

TABLE I

ANALYSIS OF 6 CANS OF POOR QUALITY KRAUT CONTRASTED WITH THE ANALYSIS OF 2 CANS OF EXCELLENT KRAUT

Brand Number	Salt Per cent	Total acid as lactic acid Per cent	Volatile acid as acetic acid Per cent	Non-volatile acid as lactic acid Per cent	Ratio	Alcohol Per cent	Length of Cut*	Texture†	Color‡	Odor‡	Flavor‡	Remarks
54	**3.2**	1.40	**0.47**	**0.69**	**0.68**	**0.45**	L	**S**	P	U	U	Rotted
94	1.9	**1.01**	0.30	**0.56**	**0.54**	0.09	S	S	F	U	U	Fishy
93	**1.6**	**0.62**	**0.11**	**0.46**	0.22	0.09	M	S	G	F	P	Washed out, flat
12	**1.6**	1.42	0.25	1.04	0.24	**0.36**	M	F	G	U	U	Secondary fermentation
50	**1.3**	**0.74**	**0.19**	**0.45**	**0.42**	**0.40**	M	**S**	P	P	U	Very abnormal
14	**0.7**	1.28	0.28	0.86	0.32	0.18	M	S	G	G	F	Too soft
3	2.2	1.30	0.21	0.99	0.21	0.23	M	F	G	E	E	Excellent
5	2.4	1.48	0.29	1.04	0.28	0.29	L	F	E	E	E	Excellent

*L = Long, M = Medium, S = Short.
†F = Firm, M = Medium, S = Soft.
‡E = Excellent, G = Good, F = Fair, P = Poor, U = Unsatisfactory.
Abnormal chemical results are indicated by bold face type.

Very frequently fermentation carried out with a low salt content is expressed by a soft textured product (*e.g.*, Table I, Brands Nos. 50 and 14). The relation of salt concentration to texture is shown in Table II. Kraut that has a high salt content during fermentation is often discolored, sometimes pink, and usually has an abnormal flavor. Fermentation is abnormal in such cases and as a result the volatile acid may be low and the alcohol content high.

TABLE II

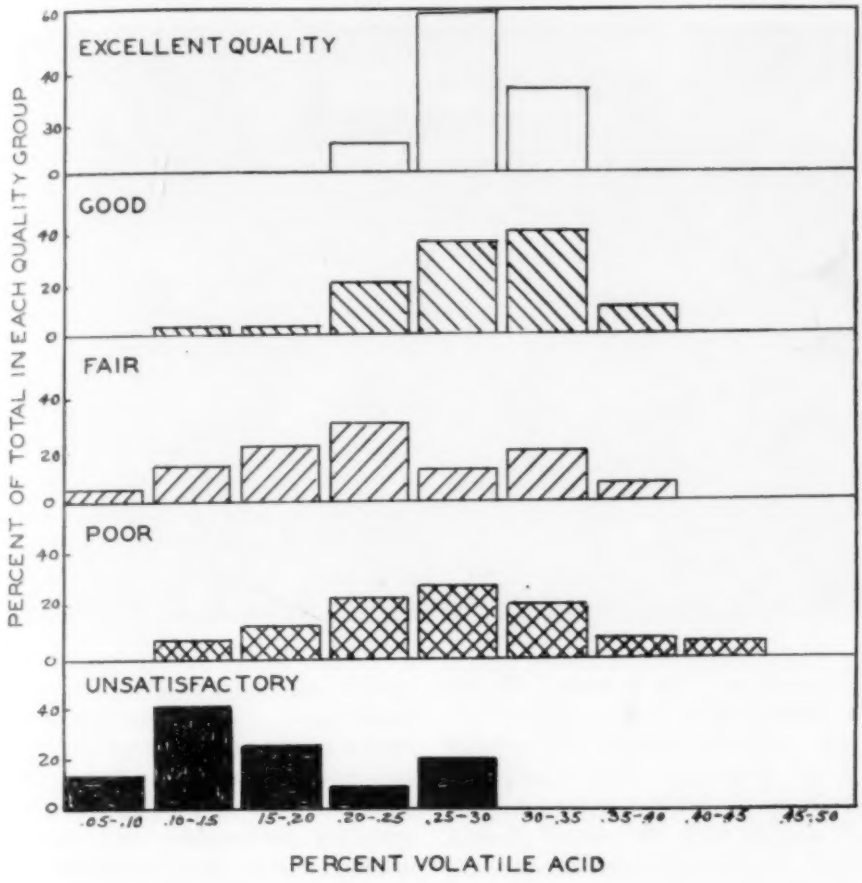
THE RELATION OF SALT CONCENTRATION TO TEXTURE IN CANNED KRAUT

Number of Samples	Salt Per Cent	Percentage of samples of Soft Texture	Salt Content
5	2.8–3.4	60	Too high
28	2.2–2.5	7	
37	1.8–2.1	22	Normal
22	1.5–1.7	41	
10	0.7–1.4	80	Too Low

Volatile acid (largely acetic) is almost entirely produced by the organisms that start the fermentation process, and is present usually in quantities of about 0.25 per cent in canned kraut, and slightly higher (0.28 per cent) in bulk kraut. Considerable variation from this may be found. A volatile acid content above 0.32 per cent or below 0.20 per cent is often an indication either of an abnormal fermentation, or of a secondary fermentation. The former may be due to the fermentation having taken place at too high a temperature, to faulty salting or packing. Secondary fermentations

FIGURE II

The relationship of quality to volatile acid content as found by analysis of 184 samples of bulk kraut.



often result in the destruction of acid. The volatile acid content is often abnormal in the poor quality samples. A summary of the relationship of quality to volatile acid content in canned kraut as found from the analyses is given in Figure I. From these figures it may be noted that the volatile acid content of the good and excellent krauts all fall within 0.15 to 0.35 per cent. Samples rating poorer than this more often show analyses lower or higher. A similar summary for a number of bulk krauts is given in Figure II. The relationship is similar in this case, but the total volatile acid figures are slightly higher, there being no dilution of acid as in canning.

Secondary fermentations of kraut are usually caused by yeasts (Figure III). They manifest themselves in a peculiar yeasty or even putrid odor. Often their action can be detected by an increased alcohol content, sometimes by the presence of yeast cells and occasionally by cocci in a microscopic preparation. The quantity of alcohol present in bulk kraut is normally somewhat higher than in canned kraut.

A form of manipulation that is difficult to detect is the washing of discolored kraut, such as pink kraut, a

FIGURE III

A sauerkraut vat in which juice has covered the boards. Yeast grows on the surface resulting in a secondary fermentation.

condition caused by a secondary fermentation. Such kraut may show proper color and texture, but usually has an undesirable flavor. In these cases unless the kraut is canned in brine from another tank, the canned product will be found uniformly low in total acid, volatile acid and salt.

In conclusion, it may be stated briefly that the quality of kraut bears a definite relation to its chemical composition. Defects in fermentation or in canning can often be detected by careful analyses and proper interpretation of the results supplemented by a microscopic examination. The determinations of total acid and salt are simple procedures and the results are fairly definite. The determinations for alcohol and volatile acid are comparative and very frequently reveal defects in this food product. Microscopic examination is valuable at times as a means of detecting secondary fermentations.

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The Committee on Professional Education

THE Committee on Professional Education was provided as a fifth standing committee by the Governing Council of the American Public Health Association at the Annual Meeting in Washington, 1932. Although this action was taken the actual appointment of the committee was not completed until the early part of 1933. This committee was established to replace the Committee on Training and Personnel which was a sub-committee of the Committee on Research and Standards.

The purpose of the Committee on Professional Education is to carry on studies and determine standards for the professional education of those who wish to adopt public health work as a career, and perform such other functions along this line as will raise the level of efficiency in public health administration and in the specialized phases of public health.

The By-laws provide that the committee shall consist of 10 members. The committee personnel is at the end of this report. The personnel of this committee was approved by the Executive Board at its meeting in March, 1933.

The amount of $1,000 has been allocated by the Finance Committee for the Committee on Professional Education; $500 of this amount is designated for travelling expenses, and the remainder for the salary of a part-time secretary.

This committee held its first meeting in New York on May 6, 1933. It was attended by all members with the exception of one who was unavoidably detained. This session of the committee was devoted entirely to a discussion of policies and objectives. A communication was sent to each member by the chairman prior to the meeting requesting that he indicate what he thought should be the activities of the committee. These communications were presented at this meeting and in a considerable measure stimulated the discussion which occurred. The primary purpose of the meeting was to determine the elements that should be considered in formulating a program. Definite progress was made in accomplishing this purpose.

As a result of this discussion it was thought desirable to consider the following problems in the initial activities of the committee.

1. Qualifications, Certification, and Licensure of Health Officers
2. Professional Qualifications of Public Health Nurses
3. Qualifications of Sanitary Engineers and Sanitary Officers (Inspectors)

It was the consensus of opinion that this work should be done under the direction of three sub-committees. The committee authorized the appointment of the following sub-committees.

Sub-committee on Qualifications, Certification, and Licensure of Health Officers

Allen W. Freeman, M.D., *Chairman*
Huntington Williams, M.D.
Thomas Parran, Jr., M.D.
C. E. Turner, Dr.P.H.
W. G. Smillie, M.D.
Stanley H. Osborn, M.D.
Clarence L. Scamman, M.D.
W. P. Shepard, M.D., *Consultant*

Sub-committee on Professional Qualifications of Public Health Nurses

Lillian Hudson, R.N., *Chairman*
Clarence L. Scamman, M.D.
Dorothy Carter, R.N.

Sub-committee on Qualifications of Sanitary Engineers and Sanitary Officers (Inspectors)

Ralph Tarbett, C.E., *Chairman*
H. G. Baity, Sc.D.
Arthur P. Miller, C.E.
Walter S. Mangold
J. L. Barron
H. H. Howard, M.D., *Consultant*

The work of these sub-committees is progressing satisfactorily.

THE INSTRUCTION OF MEDICAL STUDENTS IN PREVENTIVE MEDICINE AND PUBLIC HEALTH

It was the sense of the committee that there is great importance attached to the proper instruction of medical students concerning the prevention of disease and the measures employed in public health administration. Obviously this is not being done well in medical schools at the present time. This question was discussed at some length and a sub-committee appointed consisting of Dr. W. G. Smillie, *Chairman,* Dr. W. S. Leathers and Dr. Kendall Emerson. This sub-committee was requested to prepare a memorandum with reference to this problem and present it to the Council on Medical Education, Licensure and Hospitals of the American Medical Association at its next session with a view of enlisting its interest and coöperation in stimulating changes in the medical curriculum so that students may obtain more adequate instruction in the preventive and public health aspects of medical service.

Another meeting of the Committee on Professional Education was held in New York on December 17, 1933, for the purpose of receiving reports from the sub-committees and to determine more definitely the program for future activities.

A report was made by Dr. Freeman, *Chairman* of the Sub-committee on Qualifications, Certification, and Licensure of Health Officers, on certain principles which underlie the work of the committee, with particular reference to qualifications. After considerable discussion this report was adopted.

A report was made by Miss Hudson, *Chairman* of the Sub-committee on Professional Qualifications of Public Health Nurses, as follows:

I. Review
   A. Definition of Public Health Nurse
   B. Minimum Qualifications for those Appointed to Positions in Public Health Nursing

      Those qualifications, adopted in 1931, will be reviewed on the basis of the findings in a recent survey made by the National Organization of Public Health Nursing. Recommendations will be made as to whether or not changes are desirable.

II. It was further agreed that the sub-committee should study the desirability of certification of public health nurses on a State or National basis.

Since the committee has met, the following has been done which may be of interest:

1. No decision has been reached as far as changing the term "Public Health Nurse" is concerned.

2. A slight change has been made in the definition of Public Health Nurse—the term "application of" having been eliminated.

This report was accepted.

Mr. Miller, in the absence of the Chairman, made a preliminary report of

the Committee on Qualifications of Sanitary Engineers and Sanitary Officers (Inspectors). He stated that much can be done to improve the training of public health engineers; that the engineering courses include too much design. The committee should also strive to elevate the standards of the sanitary officer or inspector. It is desirable to raise the qualifications for this grade of public health personnel and establish standards which will more definitely establish the status of the sanitary officer or inspector as a health worker. Mr. Miller's report was accepted.

Dr. Smillie made a report with reference to a conference with the Council on Medical Education, Licensure and Hospitals of the American Medical Association and stated that the Secretary, Dr. W. D. Cutter, agreed to have a paper on the teaching of preventive medicine on the program at the meeting in Chicago in February, 1934. The committee expressed appreciation for achieving this result.

It was the sense of the committee that a dinner session should be arranged each year during the Annual Meeting of the American Public Health Association for the purpose of stimulating discussion concerning certain important problems in the field of professional education.

It was voted that the chairman of each of the three sub-committees be requested to bring in a report from his sub-committee concerning the minimum qualifications of health officers, public health nurses, sanitary engineers, and sanitary officers (inspectors), respectively for consideration of the main committee at its next meeting.

The discussions of the committee were stimulating and constructive and as expressed by one member, Dr. Sundwall, in a recent communication to the chairman, "the meeting was in every way worth while and real progress was made."

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C. E. TURNER, DR.P.H., *Secretary*
LILLIAN A. HUDSON, R.N.
JOHN SUNDWALL, M.D.
HUNTINGTON WILLIAMS, M.D.
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RALPH TARBETT, C.E.
CLARENCE L. SCAMMAN, M.D.
W. G. SMILLIE, M.D.

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SAFE MILK

IT is hard to say too much on the subject of safe milk and its importance to the younger portion of our population. In the United States we are proud in believing that we come pretty near to leading the world in the precautions that we have taken and in the response of the dealers. There is abundant evidence, however, that other countries, not only in Europe but on this side of the water, are doing their best to make things as good as possible.

The January number of the *Canadian Public Health Journal* is called "Special Milk Number," and is devoted entirely to the various aspects of milk production. That country and the provinces of which it is made up, have gone through the same sort of opposition which we encountered over here, but it is most interesting to note that in 1921, the Saskatchewan Dairy Association passed resolutions favoring legislation in cities for the compulsory pasteurization of all milk and cream. Somewhat later, the National Dairy Council of Canada endorsed the principle of pasteurization, and in 1933, in Ontario, the producers and distributors adopted a province-wide law requiring pasteurization in towns and cities. In other parts of Canada, somewhat similar movements have taken place and some of them have laws requiring the counsel and advice of provincial departments of health for the approval of plans for pasteurization plants. In Saskatchewan, Manitoba and Quebec, such provisions have already been incorporated in the laws, and in others the movement is going forward. The filing of plans for such plants is closely associated with the question of licensing, which seems to be extending in our sister country very rapidly, insuring a system of adequate supervision. Canada has had some very severe lessons, notably the epidemic in Montreal in 1927, in which there were 5,002 cases, with 533 deaths. From the period 1906–1919 inclusive, but 6 epidemics were recorded, while in a similar period, 1920–1933, there were 42. While increase in population may have had something to do with this increase in epidemics, the authorities believe that the difference shows clearly the

active participation of health authorities, local and provincial, in the care of milk and the investigation of diseases. The following epidemics have been recorded:

	Epidemics	*Cases*	*Deaths*
Typhoid	35	6,514	674
Paratyphoid	3	522	3
Scarlet	7	192	0
Septic Sore Throat	3	584	4
	48	7,812	681

Pasteurization is not as widespread in Canada as might be desired. According to available statistics, only 25 municipalities require that all milk sold be pasteurized. Altogether, a population of 3,067,362 is served with pasteurized milk to a greater or less extent. Only 5 of these report that 100 per cent of their milk is pasteurized, 12 of them reporting that 100 per cent of the cattle furnishing the milk is tuberculin tested. As a rule, the cities that endorse pasteurization most strictly are those in which tuberculin testing is best carried out, but there are some notable exceptions. Windsor and St. Catharines, for example, apparently depend almost entirely on pasteurization, the tuberculin testing running only 5 per cent for the former city, and 8 per cent for the latter.

The review of the situation in Canada includes a short but excellent study of the nutritional value of pasteurized milk, ending with the conclusion that observations on large groups of children have shown that growth is as satisfactory with pasteurized milk as with raw, and pointing out that calcium is the only valuable dietary constituent which is affected, and ending with the advice that some source of vitamin C be included in the diet.

This Special Milk Number is full of interest and can be recommended for study by all health officers, producers and distributors.

ORAL HYGIENE

ONE has only to scan the literature casually to recognize the prominent place in prevention of disease that oral hygiene has come to occupy. When one tries to write on the subject—except for fundamental principles which are generally accepted—he finds himself lost in a maze of contradictions and uncertainties; yet we feel that all interested in this phase of preventive medicine should attempt to keep up with the advances which are being made.

For some years attention has been largely focused on the part played by vitamins in the development of the teeth, and to some extent even in the arrest of caries. All agree that proper nutrition plays a large part in the development of the teeth, but it is equally sure that proper development may be a very different thing from proper maintenance. It has not yet been shown whether these different requirements are quantitative or qualitative.[1]

Many studies have been made on the composition of teeth, and Hoppe-Seyler as early as 1881, pointed out that the dentine of the tooth might be called bone in its purest form. Many studies have been made also on mineral metabolism, especially calcium and phosphorus. Some authentic work has shown that during the last month of pregnancy there is a loss of calcium amounting in some cases to 0.5 gram per day. Long before these observations, the old saying, "A tooth for every child," was common. In some of the lower animals, when the

mother receives a poor diet during pregnancy and lactation, the teeth of the offspring show less calcification. Sherman has shown that in American diets, if there is a deficiency, it is likely to be in respect to calcium. On such findings is based the advice, so widely given, to use milk, since the average calcium requirement of children is about 1 gram per day, and milk is our best source for this element. Whether such teeth are more liable to caries or not is questionable. The work of Mrs. Mellanby, who lays so much stress on vitamin D and also on vitamin A, is well known. Against this, studies at Yale have led to the conclusion that there is no constant parallelism between rickets and subsequent susceptibility to caries. In cases of severe rickets in infancy, a greater incidence of caries is found, while in respect to the permanent teeth in 7 year old children, no significant difference in the incidence of caries in the hypoplastic and non-hypoplastic groups was observed.

Perhaps the animals that we have used experimentally are not the best suited for such work, as is suggested in the article by Cowgill.[1] Mrs. Mellanby was not able to produce caries in puppies regardless of their dental structure. Bunting, at Michigan, has found the same difficulty and has suggested that the conical shape of the dog's teeth plays a protective rôle. Many dentists hold that the relative resistance of the canines in man is due also to their shape. Bunting goes back to the idea, held for so many years and still believed in by many dentists, that the carbohydrate diet of man is responsible to a great extent for caries, and gives records of groups of children fed under his direction which are hard to explain otherwise.

Certain observers claim that the intake of extremely large amounts of vitamin D results in the development of caries. Their experiments were done on animals fed a rachitogenic diet low in phosphorus, and the experiments of other observers contradict these results. Mrs. Mellanby feels sure that vitamin A has a marked effect in preserving the health of the gingival tissues and that by proper feeding, caries may be arrested and to a certain extent healed, though she admits that the mechanical movements of the mouth have something to do with the results.

On the other hand, Bloch believed that vitamin A is in no way related to the development of caries. It seems to have been definitely proved that in some species, vitamin C has something to do with the proper development of teeth. A shortage of this factor is evidenced by a derangement of the odontoblastic cells and failure of the newly formed dentine matrix to harden. Cowgill points out that the number of variables operating in nutritional investigations is very great and the planning of a nutritional experiment along these lines is difficult. Consequently, it is not surprising that no one is able to make precise statements concerning the relation of the dietary factors involved in the maintenance of healthy teeth. He suggests that experiments on monkeys and apes might give results which are more reliable, and calls attention to the fact that many laboratories now are using such animals quite extensively so that it may be easily possible to extend the observations along the lines of dental health.

While it is believed that everyone who has studied the question recognizes the many conflicts of opinion as well as experimental evidence, there are certain fundamentals about which we can speak surely. We should recognize and give credit to the work of the dentists in calling the attention of the public to many of these matters, especially the necessity of correcting errors of occlusion, irregularities of teeth, and maintenance of cleanliness. As the dentist sees the majority of children early, often before they are carried to a physician, he is in a position to detect the

early signs of beginning systemic disease. Owing to this, there should be a much closer relation between physicians and dentists than now generally exists. For a long time dentistry was largely occupied in the mechanical factors of prosthesis. Without belittling the necessity of this work, it must be pointed out that it is often only a small part of the problem, and is often done more for esthetic purposes than for the prevention of systemic disease. It is interesting to note that this factor was operative as far back as the time of Solomon who complimented the Queen of Sheba as follows: "Thy teeth are like a flock of sheep that are even shorn, which come up from the washing." In the doggerel of today, the same idea has been expressed, "And teeth so white, you almost wish your ear she'd bite."

Preventive measures would call for a broadening of the scope of dental reparative work, such as is being carried out at present in some of our cities. At once we come in touch with a great social and economic question; namely, public health service.[2] We may then say positively that oral hygiene in general has a place, and a most important place, in the scheme of preventive medicine, and is worthy of the attention not only of physicians and dentists, but of health officers.

REFERENCES

1. Cowgill, George R. The Diet in Relation to Dental Problems, *Dental Cosmos*, Feb., 1934, p. 223.
2. Barker, L. F. On the Interests that Physicians and Dentists have in Common, *J. Dental Res.*, 13:105–115, 1933.

LETTER TO THE EDITOR

To the Editor:

PRECISION in the use of words, numbers or symbols is a characteristic of the exact sciences. The word "oxygen" means the same thing to scientists everywhere; the number "one" has a constant meaning for all mathematicians; and the symbol "H_2O" is interpreted as water uniformly and definitely by chemists throughout the world.

When we consider the so-called "social sciences" we find no such universal dictionary of definitions. Words do not have a common connotation. This leads to confusion, prolific explanations and oftentimes to misunderstandings.

In the field of public health, outside of the use of legal, medical, and engineering terms, confusion is worse confounded. The legal profession can turn to *Black's Law Dictionary;* the medical profession, to *Dorland's* and *Stedman's Medical Dictionaries;* and the engineers, to the *Engineering Index.* If public health is to attain a position as a science there is need for a "Dictionary of Public Health."

Abundant illustrations which serve to point this need can be brought forward. It is a commonplace in current public health discussion to find "doctor" used interchangeably with "physician." Custom, traceable to earlier conditions in society when the professions were limited, sanctioned "Reverend" as the hall-mark in the ministry; "professor," in education; "doctor," in medicine. With the rapid diffusion of higher education, particularly in the United States, there has come an immense proliferation of degrees until today the earlier marks of the professions have become so jumbled as to be well-nigh meaningless.

As a matter of fact, the word "doctor" nowhere appears in a medical

dictionary—but there does appear the abbreviation "M.D.," or doctor of medicine.

Again, in the current issue of *Public Health Reports*[1] in which appears a directory of whole-time county health officers for 1933, such officers are designated by law as follows:

Alabama—County Health Officer; Arizona — Director; Connecticut — Superintendent of Health; Georgia—Commissioner of Health; Massachusetts —Director of Public Health; Medical Director; and County Health Officer; Michigan—District Health Officer; Pennsylvania—County Medical Director; and Virginia—just plain health officer. Is it any wonder the poor layman stumbles and is confused when he seeks for the term with which to describe the administrative official charged with the public responsibility of protecting the health of the community?

One further example will suffice. In the recent issue of the volume *Community Health Organization*,[2] the current hesitation in the selection of the term to describe public health activities carried on outside of the official field, one will find the following words used interchangeably within the space of 10 pages — private — voluntary — unofficial—non-official.

That there is need for exactness of expression has been demonstrated from time to time. The *American Journal of Public Health* has listed occasionally in its pages words and phrases employed in public health work, with their definitions. Since public health is a composite discipline drawing its materials from medicine, engineering, law, statistics, nursing, education, social science, and administration, it would seem that some effort should be made to compile a dictionary for the benefit of the workers in the public health field.

If mass education of the public in health matters is to proceed apace, certainly the public health workers themselves should be able to employ their tools with a minimum of hesitation and obfuscation. It is true, such a task would be time-consuming, expensive, and difficult, but until it has been undertaken public health will continue its stumbling and halting progress toward its goal as a science.

Dr. Oliver Wendell Holmes was not far wrong when he said "Science is the topography of ignorance," and equally well could have said there is need of topographers in science. Particularly is this true in the area of public health.

ROBERT G. PATERSON, PH.D.,
Executive Secretary,
Ohio Public Health Association

1. *Pub. Health Rep.*, 48, 28:818-826 (July 14), 1933.

2. *Community Health Organization.* Edited by Professor Ira V. Hiscock, A.P.H.A., 1932.

LETTER FROM GREAT BRITAIN

THE OVERSHADOWING SLUM

At the end of 1933, as for a considerable time before, in public health circles here the main pre-occupation of the authorities and their officers appeared to be housing. For months the Minister of Health had been engaged in visiting various parts of the country, seeing for himself how matters stood, and urging, encouraging, and threatening the persons responsible in areas in which arrangements for assisting forward his 5-year plan of slum clearance were hanging fire or had not been put in hand. Speaking generally, in most districts it is almost true to say that apart from housing activities, and largely because of them, little more than

the ordinary routine work received attention during the year.

Fortunately, there has been no marked prevalence of any particular disease for some time, and, so far as death rates show, the infant welfare and tuberculosis schemes are functioning satisfactorily. Exactly the amount of faith that should be reposed in death rates as a guide is always difficult to decide. Even in this matter of slum clearance, death and to an extent also disease rates frequently fail to lend support to those who are pressing for removal, proving infinitely more useful to those who are backing the owners of the slums and objecting to schemes of clearance.

So again frequently is it in the case of persons transferred from slums and placed in what appear to be improved surroundings. In this connection I have referred already, I think, to the investigations of Dr. G. C. M. M'Gonigle, Medical Officer of Health of Stockton-on-Tees, who found that both the mortality and morbidity rates noted among re-housed individuals were higher than in those who remained in the slum area.

HOUSING, MORBIDITY AND MORTALITY

Dr. M'Gonigle's explanation of this difference was that the persons in the newer houses, having to pay more in rent had less to spend on food, and had less resistance therefore to offer to disease. This doctrine was one very readily accepted by quite a number of people, particularly those who have been responsible for the raising of the barriers to progress in slum clearance.

The determination not to permit these barriers to remain, or such considerations as were put forward by Dr. M'Gonigle to strengthen them, culminated in the initiation of the drive which has been one of the outstanding features of 1933.

Who exactly has been responsible for it is quite difficult to make out. Definitely there must have been some special impulse, and there is strong reason to believe that it came from the Royal Family. That the King and Queen are and have been gravely concerned is, of course, well known, and the Prince of Wales has spoken very freely on the subject on numberless occasions and in a variety of places.

Sir Hilton Young, who himself carries the fiery torch, speaking at the dinner of the Society of Medical Officers of Health in November, claimed that the medical officers of health were the spear-head of the attack. It is undoubtedly the case that these officers have very heavy responsibilities in this matter. These they have never neglected. Nor have they neglected to condemn the slum, to deplore the conditions under which so many of the people for and among whom they worked were compelled to exist, and to urge that action should be taken.

Practically there is no medical officer of health who has not directed attention, not once but many times, to the existence of slum conditions, recorded his opinion that these conditions were inimical to health, and urged that they should be dealt with. In doing so he has defied statistics, and on such occasions as the call for action has been heard and procedure for securing clearance has been taken, has had to suffer for his temerity at the hands of counsel and witnesses engaged by those opposed to action.

UNEMPLOYMENT AND THE PUBLIC HEALTH

Another connection in which death and disease rates and such-like statistical manifestations appear to certain people to fail to provide evidence supporting that gathered by the senses affects infants. Here and there, in several places, there are medical officers of health and others who—while prepared

to agree that the infantile mortality rate, not only for the country as a whole but in the bulk of areas, keeps low and that it is permissible to accept this as indicating that unemployment is not exerting an influence inimical to the young—are not completely convinced that all is so well as we are asked to believe.

There are quite a number of areas in which the rates are tending to rise; in which wasting and marasmic conditions and such things as enteritis are more prominently present than has been the case for some years. There are, too, many reports from health visitors and voluntary workers at welfare clinics and in the homes of the people that very many more families are showing signs of strain than was formerly the case. Adult members of families, it is claimed, have been sacrificing themselves for a long time in order that the younger ones shall not suffer, and are now beginning to show signs.

In matters of this sort it is easy, of course, to attach exaggerated importance to cases that actually are isolated. It is a fact, however, that in most health departments the health workers who are out and about among the people have reports of this kind to make, and, as a result, that glow of satisfaction that the growing feeling of optimism should bring is less rosy than perhaps it should be.

THE EXPECTED MEASLES EPIDEMIC IN LONDON

By many of our forecasters it is promised that 1934 will prove to be a measles year. In the metropolis, at any rate, it is regarded as a certainty that it will reach epidemic proportions, and health officers and authorities are urged to make preparations accordingly. Largely these have reference to routine matters involving closer and more frequent supervision of school children, at welfare centers and in the homes of the people.

Comparatively little in the shape of immunizing work has been done as yet in this country in respect of measles. It is possible, however, that if opportunity presents, much more may be done in London during the epidemic that is forecast for 1934–1935, a considerable amount of experience having been obtained in the last epidemic of 1931–1932, with results sufficiently encouraging to justify work on a wider scale.

In a report of the Medical Officer of Health of the London County Council dealing with the outbreak of 1931–1932, it is shown that special attention was devoted to the question of the employment of serum, more particularly human adult serum in the control of measles.

Adult Serum in Measles—The contribution on this subject to the report by Dr. Gunn, Deputy Medical Superintendent of the North Eastern Hospital of the London County Council, is of real value, as is also a statistical paper on the same question by W. T. Russell of the London School of Hygiene and Tropical Medicine.

The total number of observations recorded was 2,362. The adult serum series numbered 1,475, while there were 680 injections of convalescent serum, the uninjected contacts numbering 207. These numbers are, rightly, regarded as rather small when it comes to drawing conclusions on some of the finer points. Certain general conclusions, however, are sufficiently well based and may safely be drawn. Among these may be noted that as to the utility of adult serum in relation to prophylaxis. This provides support for the view that it is an agent of real value. The statement made, indeed, is to the effect that in its protective and attenuating action it is only slightly inferior to convalescent serum. Having regard to the fact that

it is so very much more readily obtained than the convalescent serum, and its collection, storage, etc., present comparatively little difficulty, it is likely to occupy a prominent place in any future policy of measles control. The report gives very detailed and clear information on these matters likely to prove useful to authorities and officers desirous of including adult serum as part of their armamentarium against a disease which, though the public refuse to appreciate it, constitutes one of the most serious and difficult of the epidemiological problems with which preventive medicine is faced.

CHARLES PORTER, M.D.

London

ASSOCIATION NEWS

NEW MEMBERS

The following list includes applicants who have been approved for membership in the A.P.H.A. by the Sub-Committee on Eligibility. These new members have requested affiliation with the sections indicated, and action by the Section Councils will follow.

Health Officers Section

Herbert R. Edwards, M.D., New Haven Department of Health, City Hall, New Haven, Conn., Acting Health Officer

G. L. Rees, M.D., Smithfield, Utah, City Health Director

Ernest L. Stebbins, M.D., C.P.H., Henrico Health Dept., Richmond, Va., Director

Laboratory Section

William J. Allexsaht, M.D., Gowanda State Hospital, Helmuth, N. Y., Pathologist, and Director of Laboratory

Russell Gottschall, Ph.D., 5050 Paddock Rd., Cincinnati, O., Assistant Bacteriologist, Wm. S. Merrell Co.

Thomas S. Hosty, M.A., 921 W. Woolman, Butte, Mont. (Assoc.)

Attracta F. Murray, B.A., 47 Prospect St., Waterbury, Conn., City Bacteriologist

Abraham M. Schaefer, M.D., 650 Main St., Hartford, Conn., Pathologist, Mt. Sinai Hospital

H. R. Thornton, Ph.D., University of Alberta, Edmonton, Alta., Canada, Professor of Dairying

Vital Statistics Section

Marian C. Holland, 647 Sinaloa Ave., Pasadena, Calif., Deputy Registrar, Vital Statistics Division

Public Health Engineering Section

James L. Barron, C.E., 20 N. Broadway, White Plains, N. Y., Director, Division of Sanitation, Westchester County Department of Health

Oral W. Fowler, 491 Second Ave., Yuma, Ariz., Sanitation and Dairy Control Work, City Health Department

W. H. Larkin, C.E., 2 E. Main St., Middletown, N. Y., District Sanitary Engineer, State Department of Health

James H. Le Van, C.E., Suite 816, New Post Office Bldg., Chicago, Ill., Assistant Sanitary Engineer, Regular Corps, U. S. Public Health Service

Frederick C. Roberts, Jr., S.B., State Board of Health, Phoenix, Ariz., Sanitary Engineer

Fred E. Smith, M.S., 38 Linnaean St., Cambridge, Mass., Chemist, City Water Department

Fred H. Stutz, City Health Department, Coral Gables, Fla., Director, Bureau of Inspection

Ralph B. Wiley, B.S., 777 Russell St., W. Lafayette, Ind., Professor of Sanitary Engineering, Purdue University

Industrial Hygiene Section

Joseph E. Burns, M.D., 946 Main St., Buffalo, N. Y., Attending Physician, Jacob Dold Packing Company

Child Hygiene Section

Dorothy E. Loope, R.N., Ft. Thompson, S. D., U.S.I.S., Field Nurse

Velma V. Spaulding, Ph.D., Denver Tuberculosis Society, Denver, Colo., Executive Secretary

Public Health Education Section

H. Shirley Dwyer, D.D.S., 62 Hanson Place, Brooklyn, N. Y., Supervising Dentist, City Health Department

J. J. Guenther, M.A., 4509 Seward St., Omaha, Nebr., Lecturer in Public Health, Nebraska M. E. Hospital

Emma Lambert, R.N., Hydaburg, Alaska, Public Health Nurse

George J. Wherrett, M.D., 306 Plaza Bldg., Ottawa, Ont., Canada, Executive Secretary, Canadian Tuberculosis Association

Public Health Nursing Section

Gertrude Dorsey, R.N., 222 E. Fourth, Sedalia, Mo., Visiting Nurse, Metropolitan Life Insurance Company

Lillian Johnston, 23 Gedney Terrace, White Plains, N. Y., Public Health Nurse, Westchester County Department of Health

Louise Knapp, M.A., 509 W. 121 St., New York, N. Y., Instructor, Public Health Nursing, Dept. of Nursing Education, Teachers College, Columbia University

Ruth M. Mountjoy, R.N., 1501 W. Yakima Ave., Yakima, Wash., Assistant City Visiting Nurse

Mildred T. Sanderson, Rm. 35, Mun. Courts Bldg., St. Louis, Mo., Superintendent, Municipal Visiting Nurses

Epidemiology Section

Henry E. Meleney, M.D., Vanderbilt University School of Medicine, Nashville, Tenn., Associate Professor of Preventive Medicine and Public Health

James E. Perkins, M.D., Dr.P.H., C.P.H., State Department of Health, Albany, N. Y., Epidemiologist

Unaffiliated

Col. Roy W. Gausmann, Societe des Eaux, America St. No. 2, Athens, Greece, General Manager, Water Company (Assoc.)

William W. T. Squire, State Office Bldg., Hartford, Conn., Secretary, charge of Bureau of Adult Welfare

MRS. FRAAS APPOINTED TO NEW POSITION

Mrs. Alma W. Fraas, Secretary of the Committee on Administrative Practice, has left the Association to become Secretary to the Commissioner of Health of New York City, Dr. John L. Rice. She was formerly a member of the Research Division of the American Child Health Association and for the past several years has been Secretary of the Committee on Administrative Practice.

PUBLIC HEALTH ADMINISTRATION

THE FAMILY PHYSICIAN AND DENTIST IN PREVENTIVE MEDICINE

GEORGE B. DARLING, JR., DR.P.H.
W. K. Kellogg Foundation, Battle Creek, Mich.

INCLUDED in the summary of findings and conclusions of the committee which studied city health organizations for the White House Conference on Child Health and Protection, there appeared the following:

> Some activities now included in the program of most health departments can be transferred gradually to the general practitioner of medicine. In the interest of child health, in so far as practical, the family physician should become a practitioner of preventive as well as curative medicine. He should take an interest in seeing that his clients are protected against smallpox, typhoid fever, and diphtheria, and that adequate periodic physical examinations are made. The public health service should stimulate interest in extending postgraduate instruction to the general practitioner of medicine to interest him in this type of service, and also to establish reasonably uniform methods of procedure.

There is a growing tendency to improve the coöperative relationship between local health organizations, both official and voluntary, and the medical and dental professions. In the expansion of such services, it should be understood that there is no place in such plans of professional participation in health work for the elimination or even the curtailment of the work of the official local health department. On the contrary, the first essential of such an enterprise should be the establishment of a whole-time, properly personneled and reasonably financed, local health department. Such a recommendation was unanimously approved by the delegates to the last annual meeting of the Michigan State Medical Society and this state organization is now engaged in a plan for extending such coöperative services to every county in Michigan.

Noteworthy progress has been made during the past 20 years in reducing death rates and in minimizing the prevalence of such communicable diseases as typhoid fever, smallpox, and diphtheria. Nineteen hundred and thirty-three will be remembered throughout the nation as a year of low death rates, one with new, low, all-time records for many infectious diseases. Apparently we have been carried forward by the momentum of previous years, as a direct result of the seeds of health education which were so effectively sown during the more prosperous times. The public mind has been aroused to the necessity of community effort in the furtherance of public health services. While there may be momentary lapses in the health programs and temporary curtailments of adequate support for health problems, there can never occur a reversion to the high mortality of 20 years ago. Our people are demanding protection for themselves and for their children. The local health machinery must be maintained in good working order. The health officers must use their ingenuity in finding the means with which to carry them through the period of stress and strain.

In general the medical aspects of the local health program can be provided

in either one of two ways: first, by the employment of physicians and dentists on a salary basis; or second, by bringing into active coöperation the existing professional resources of the local community so that the doctors and dentists will practise preventive medicine along with curative medicine in their own offices. The fulfillment of this last mentioned program requires the hearty coöperation of the health officer who must act as a stimulating agent in forcibly bringing to the attention of the public the need of such preventive services and in coördinating the activities of the various professional groups.

The progress in this direction is well illustrated in the annual report of the Barry County Health Department just released by the Health Officer, Dr. M. R. Kinde. Barry is a typical rural county located in the southwestern part of the State of Michigan. The only city is Hastings with a population of 5,227. There are four incorporated villages. The county has a population of 20,928, of whom 96 per cent are native white. The county contains 560 square miles and has an efficient County Health Department consisting, in addition to the Health Officer, of a sanitary engineer, a public health nurse, and a clerk. The W. K. Kellogg Foundation has also assigned to this county 4 public health nurses all of whom are qualified graduate teachers. Certain additional services are from time to time provided by the Foundation.

In this rural area the physicians and dentists have organized themselves so that they have become an important part of the health machinery of the community. The Health Department serves as a coördinating body; the Health Officer himself serves as secretary of the County Medical Society and acts in an administrative capacity in formulating the services and in organizing the work which is carried on by the physicians and dentists so far as possible in their own offices.

At the beginning of the year 1933 it was determined that every school child in both the rural and urban schools should receive a health examination at the hands of the practising physicians working under a plan controlled jointly by their local medical society and the Health Department. Each physician has taken his turn in giving the screening examination to the children at school. The dentists have organized a similar program. Following such service, the more thorough and detailed examinations, and the corrective services are provided by the professional men in their own offices where not only the school children, but the children of preschool age receive their diphtheria protection and are vaccinated for smallpox. An intensive educational program to encourage the coöperation of the parents has been sponsored by the County Commissioner of Education and promulgated through the medium of the school teachers and with the coöperation of the public health and teacher nurses.

The principle of the entire program is to bring the child in closer relationship with the family physician. The Health Officer states that it has long been realized that preventive and curative medicine cannot be separated and both are functions of the family physician.

An additional essential of such a program of professional coöperation is the necessity to prepare the profession, first, with respect to the group plan which should be under the control or supervision of the local medical society and health department, and second, with regard to the technical procedures to be followed. The physician in private practice should be willing to subordinate his views and plans to those sponsored by the organized profession. Failure to do so would result in mis-

interpretation on the part of the public. In the carrying out of diphtheria protection services each physician must be conversant with the accepted practices; he must know whether toxin-antitoxin or toxoid is to be used; he must have a knowledge of the reactions which may be expected in children at various ages; he must know the length of time for which protection is usually given; and he must be prepared with answers for the numerous inquiries which will occur to the public mind.

To provide postgraduate work for the physicians and dentists of Barry County, the W. K. Kellogg Foundation established a series of postgraduate fellowships not only for Barry County but for the neighboring counties of Allegan and Eaton. Of 72 physicians resident in these rural areas, 56 have already completed their first course in postgraduate training, and of 34 dentists, 28 have had the advantage of similar training. These fellowships provided for a 2-week intensive course and most of the physicians and dentists received this training at recognized professional centers in Chicago. In addition, men of professional ability have presented special subjects in the field of preventive medicine to the physicians at their own county meetings.

Experience thus far indicates that it is perfectly practical under rural conditions to carry on a coöperative health program where a well organized local health department works harmoniously with the local dentists and physicians.

Commonwealth Fund, New York City—For more than 10 years the Fund has entered into partnership with local health and hospital organizations with the view of extending the responsibility for maintaining new services or standards of health work, in so far as possible, through local financial support. The stressing of local participation in financing health and welfare projects is one of the basic principles on which the Fund has constructed its activities.

During the fiscal year ended September 30, 1933, the Commonwealth Fund expended more than $1,600,000, nearly half of which (46 per cent) went into the field of health. The program has involved rural health service, rural hospital service, medical education, and medical research. It has now been 5 years since the Fund withdrew its support for the health demonstration in Fargo, N. D., and the community has since maintained its own public health program. The health department has been accepted as one of the essential normal divisions of the local government. The character of performance has not suffered during the past 5 years as evidenced by the fact that in 1932 Fargo scored 845 points on the *Appraisal Form*. Like most American communities, economies have of necessity been made in the health service but last summer when further cuts were considered a group of citizens complained so rigorously that the city commission refused to make any further cuts in the health department appropriations. In addition to the Health Officer, the staff consists of 6 nurses and a supervisor, a milk inspector, a half-time dentist and 2 clerks. The only loss suffered due to the depression has been a second inspector and a part-time medical assistant.

During the fiscal year the Fund has continued to support health activities in Massachusetts, Mississippi, and Tennessee. In spite of the loss of nearly 50 per cent in its appropriations, the Tennessee State Health Department has maintained its excellent standards, and in 4 counties in Tennessee and Mississippi, where the Fund has aided in the maintenance of health service, the

appropriations have been definitely increased. In Lauderdale and Pike Counties, Miss., the health departments are employing private physicians as clinicians in various fields of public health service. This is considered an alternative to adding medical assistants to the health department staff, which is the preferred plan in Tennessee. In all of the 6 local coöperative enterprises in 3 states, the application of the *Appraisal Form* as a measuring stick indicates a higher score for 1932 than that attained in the preceding years.

The Commonwealth Fund has continued its support of the activities of the Committee on Administrative Practice of the American Public Health Association, and has published for the committee a review of rural public health service by Dr. Allen W. Freeman.—*Ann. Rep., Commonwealth Fund,* 1933.

Washington, D. C.—The annual report for the year ending June 30, 1933, is published with the general report of the government of the District of Columbia and contains the vital statistics for the calendar year 1932, when the death rate in this city of 493,000 was 16.12, slightly higher than that for each of the three preceding years. During the calendar year 1932, there were reported 401 cases of diphtheria, of which 16 resulted in death; 814 cases of scarlet fever with 13 deaths. Diphtheria protection service has been provided through the schools and through the child hygiene centers. The health officer is not satisfied with the extent of this immunization service, there having been 7,642 children given the Schick test during the fiscal year, of which number 4,682 gave a positive reaction and to 4,510 of whom toxoid was administered.

Typhoid fever was the cause of 6 deaths among 67 reported cases. This may be compared with 64 cases and 19 deaths for the preceding year. Of the 67 cases reported in 1932, a history of outside infection was found in 23 instances. Epidemiological studies disclosed evidence that indicates 15 per cent of the typhoid cases were due to eating raw oysters, 13 per cent to the consumption of ice cream, and 61 per cent to raw vegetables. The infant mortality rate in 1932 was 73.6 per 1,000 births.—*Rep. Government of the District of Columbia, year ended June 30, 1933.*

Maryland—The death rate from all causes in 1932 was 12.6 per 1,000 population; the infant mortality rate 69.5 and the maternal rate 5.0 per 1,000 live births. By the end of the year 22 of the 23 counties in Maryland representing 98 per cent of the total population outside of the City of Baltimore, were organized on a full-time basis. Beginning with Allegany County in 1922 the whole-time local rural health services have gradually been expanded until now virtually the entire state has been covered. Each full-time county health officer also serves as a deputy state health officer.

For the entire state there were reported 695 cases of typhoid fever, with a death rate of 3.1. Of this number 593 cases were reported from the counties; 46 ended fatally. For Baltimore there were reported 102 cases with 6 deaths. Diphtheria claimed the same total number of victims. Of the 52 deaths, 17 occurred in Baltimore and 27 in the counties. The diphtheria prevention activities have been concentrated on the protection of younger children, 14,050 of whom were immunized against the disease during the year. There were reported 49 cases of Undulant Fever and 26 cases of Tularemia.—*Ann. Rep. for 1932, State Department of Health.*

LABORATORY

THE EFFECT OF AGE, DILUTION, AND DOSAGE UPON THE IMMUNIZING VALUE OF DIPHTHERIA TOXOID

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IN a previous paper [1] we had reported finding considerable variation in the antigenic value of commercial diphtheria toxoids as determined by the Ramon flocculation test, by guinea pig protection tests, and by human experimentation. Greengard [2] found a variability in antigenic potency of several batches of commercial diphtheria toxoids as determined by immunization of infants. Povitzky,[3] in examining toxoids from different manufacturers by means of the flocculation test, found a wide variation in their antigenic values. Of the five toxoids tested by us, three had been diluted, two in a ratio of 1 to 1, and one in a ratio of 1 to 3. The highest immunity had been obtained with an undiluted toxoid. It seemed probable that dilution was one of the factors affecting the potency of toxoid. Whether or not the age of the toxoid had any appreciable effect on its antigenic value was deemed worthy of consideration and study, particularly since federal regulations allow an expiration time of 18 months on this product. The question of dosage was also considered of sufficient importance for further investigation. To determine, therefore, the effect of dilution, age, and dosage upon the immunization value of diphtheria toxoid, a series of tests was carried out, the results of which are presented in this paper.

A preliminary Schick test was given to 1,016 children between the ages of 1 and 15 years, 84 per cent of whom were in the 4 to 10 year age group. None of these children, so far as could be determined, had had diphtheria or had been immunized against it. The results are given in Table I.

Through the kindness of the Cutter Laboratory a supply of diphtheria toxoid and toxin was made available to us. Toxoid lot No. 9163 was prepared in April, 1932. This toxoid was divided into two portions early in June, 1932. One portion was left undiluted

TABLE I

RESULTS OF PRELIMINARY SCHICK TEST

Age Group	*Total No. Tested*	*Schick Positive*	*Per Cent Non-Immune*
1–3	55	51	92.7
4–5	124	111	89.5
6–10	726	626	86.2
11–15	111	86	77.5
Total	1,016	874	86.0

TABLE II

FLOCCULATION VALUES OF TOXOID LOT NO. 9163

Toxoid	*Date Tested* 1932	*Lf*	*Units per c.c.*
Undiluted	April 18	0.086	11.63
Undiluted	May 5	0.076	13.16
Undiluted	Nov. 22	0.076	13.16
Old Diluted	Nov. 22	0.152	6.58
Freshly Diluted	Nov. 22	0.138	7.25

and the other was diluted with an equal amount of salt solution and preservative. This diluted toxoid we shall speak of as the "old diluted toxoid." Another portion, the "freshly diluted toxoid," was later prepared from the original lot of toxoid, a dilution of 1 to 1 being made about a week prior to the first injection. Immunization of the children was begun in the latter part of November, 1932, and was carried on through February, 1933. Schick positive reactors only were given the toxoid immunization. Those that gave a combined (protein) reaction were excluded.

The flocculation values of the different toxoid portions were determined by Dr. Harry E. Foster of the Cutter Laboratory. The Lf value of the stock undiluted toxoid was 0.086 in April, 1932. Tests on all portions were carried out in November, 1932, 7 months after the original lot of toxoid had been made, and immediately after the freshly diluted portion had been prepared. His figures are given in Table II.

In commenting upon these values Dr. Foster states:

> Judging from the figures alone there would appear to be a discrepancy in these tests, since theoretically the specially (freshly) diluted material could not have a value better than 0.152. Practically, however, there is sometimes difficulty in telling which of the two adjacent tubes first shows flocculation and it is quite possible that in the test on undiluted toxoid the tube containing 0.076 and that containing 0.068 came down approximately together.

Anderson, Leonard, and Holm [4] are of the opinion that the flocculation reaction is not always specific, and, therefore, is not always a true measure of the antigenic value. They state further that the flocculation time is not always a true measure of avidity, as determined by flocculation. In our previously reported work [1] we showed that the guinea pig protection test gave a truer index of potency than the flocculation test.

Guinea pig protection tests were carried out on the undiluted and the old diluted portions of the toxoid. Unfortunately, guinea pigs of the size used in the protection test, 280 to 300 gm., were unavailable to include tests on the freshly diluted toxoid. Five guinea pigs were injected subcutaneously with 1 c.c. of the old diluted toxoid; 5 with 0.5 c.c. of undiluted toxoid; and 5 with 1 c.c. of undiluted toxoid. Four of the animals were subsequently lost because of death from septicemia. Six weeks later the survivors were given varying amounts of diphtheria toxin. The results are shown in Table III.

A study of Table III indicates that the undiluted toxoid gave greater protection than the equivalent amount of diluted old toxoid. Because of the few animals used no conclusions could be drawn as to the superiority of the 1 c.c. dose over the 0.5 c.c. dose of undiluted toxoid.

A total of 766 children were given the toxoid. They were divided into four groups. One group was given undiluted toxoid in two 0.5 c.c. doses at an interval of 3 weeks. A second group was given three 0.5 c.c. doses undiluted toxoid at

TABLE III

GUINEA PIG PROTECTION TESTS WITH OLD DILUTED AND UNDILUTED TOXOID, NO. 9163

Toxoid No. 9163	Size Dose	Floc. Units Injected	Diphtheria Toxin in M.L.D. Doses: 5 Guinea Pigs Inj.	5 Guinea Pigs Surv.	10 Guinea Pigs Inj.	10 Guinea Pigs Surv.	20 Guinea Pigs Inj.	20 Guinea Pigs Surv.	40 Guinea Pigs Inj.	40 Guinea Pigs Surv.
Old Diluted	1 c.c.	6.6	2	1	2	0	..	..	..	..
Undiluted	0.5 c.c.	6.6	1	1	1	1	1	0	..	..
Undiluted	1 c.c.	13.2	1	1	1	1	1	0	1	1

intervals of 1 week. A third group was given two 1 c.c. doses of the old diluted toxoid at an interval of 3 weeks. The fourth group was given two 1 c.c. doses of the freshly prepared diluted toxoid at an interval of 3 weeks. All groups were re-Schicked 3 months after the final toxoid injection.

Of the 766 children given the toxoid, 620, or 81 per cent completed the various courses of injections and were available for the final Schick test. It is rather a coincidence that exactly the same percentage of children available for the final Schick test was obtained in our previously reported work on toxoid immunization.

The diluted toxoid apparently loses potency upon aging since the freshly diluted toxoid gave over 5 per cent more immunes than the old diluted toxoid. It is probable that had the immunization tests been carried out at the expiration date of the toxoid—a good year later—a more striking difference between the old and fresh toxoids might have been obtained. The results obtained with the guinea pig protection tests also strengthen our belief that diluted toxoid loses potency upon aging, and that if diluted toxoid is to be used at all, a shorter expiration time should be required.

The question of dosage has been given considerable study and investigation by many workers. In our previously reported work we obtained from 82 to 100 per cent immunes when two doses of 1 c.c. each were given at a 3-week interval. The highest percentage immunes obtained in our present series, 98 per cent, resulted from three 0.5 c.c. doses given at weekly intervals. Advocates of the alum precipitated toxoid claim a 95 or higher percentage immunes with a single dose. It is a well known fact that repeated injections of an antigen increases the immune bodies in the reacting animal or human. Such increases are usually not proportional to the amount of antigen injected. There is evidence that a definite quantity of toxoid given in divided doses will give more protection than if given in a single dose. Park and Schroder [5] showed that a single dose of ¼ c.c. toxoid will protect a guinea pig against 10 m.l.d. toxin; whereas, if given in two doses of ⅛ c.c. at an interval of 1 week, 20 m.l.d. will be overcome; and if given in three doses

TABLE IV

IMMUNIZING VALUE OF OLD DILUTED, FRESHLY DILUTED, AND UNDILUTED DIPHTHERIA TOXOID

Toxoid No. 9163	Size Dose	No. Doses	Total Floc. Units	Interval between Doses	No. of Children Injected	No. of Children Negative on Re-Schick	Per cent Children Immunized
Old Diluted	1 c.c.	2	13.2	3 weeks	153	135	88.2
Freshly Diluted	1 c.c.	2	14.5	3 weeks	168	157	93.5
Undiluted	0.5 c.c.	2	13.2	3 weeks	161	145	90.1
Undiluted	0.5 c.c.	3	19.7	1 week	138	135	97.8

of 1/16 c.c. with intervals of 1 week, 40 m.l.d. will be overcome. Povitzky [3] also demonstrated that the degree of immunity is enhanced if a stated quantity of toxoid is given in divided rather than in a single dose. For these reasons we are of the opinion that the number of doses rather than the number of flocculation units influences the percentage of immunes obtained with any given toxoid.

A small number of children were re-Schicked who, through illness or for other reasons, had been unable to complete the full course of injections. Twenty-two children were given one injection of the old diluted toxoid; 7, or 31 per cent, were negative on the re-Schick. Six children given one injection of the freshly diluted toxoid were still positive on the re-Schick. Of 5 children given only one injection of undiluted toxoid, 3, or 60 per cent, became Schick negative. Of 10 children given two injections of the undiluted toxoid at a weekly interval, 9, or 90 per cent, were negative on the re-Schick.

The inference of Massey [6] that rural children do not react to the Ramon toxoid to the same degree of immunization as do urban children was not corroborated by our findings. Of the 620 children given the toxoid injections 180 were from distinctly rural communities. The results obtained on these rural children are indicated in Table V.

Ninety per cent of the rural children were immunized with the toxoid, whereas, 93 per cent of the urban children were so immunized. These figures certainly confirm Dr. Park's findings of 90 to 98 per cent immunes in young children who receive two doses of Ramon toxoid. The low percentage of immunes obtained by Massey—61 per cent—might probably be explained by the use of a toxoid low in immunizing value. Occasionally even the Schick toxin may not be as strong as or even stronger than the label indicates. Several years ago, one of us (W.L.) on checking a commercial diphtheria toxin used for the Schick test found it to be exactly four times as strong as the label indicated.

CONCLUSIONS

Diphtheria toxoid may be expected to give a high percentage of immunes if it be of high antigenic value as determined by the guinea pig protection test. Of 620 Schick positive children given toxoid, 572, or 92.2 per cent, were found to be Schick negative 3 months after the last injection. Rural children reacted equally well as the urban children. Toxoid which has been diluted loses some of its potency upon aging, and the expiration time of 18 months allowed by the federal government is too long. Undiluted is preferable to diluted toxoid. Three 0.5 c.c. injections of un-

TABLE V

INCIDENCE OF DIPHTHERIA SUSCEPTIBLES AMONG RURAL CHILDREN AND PERCENTAGE IMMUNIZED BY RAMON TOXOID

Preliminary Schick Test				*Immunization with Toxoid No. 9163*			
Age Group	*No. Tested*	*Schick Positive*	*Per cent Non-immune*	*Toxoid*	*No. Inj.*	*No. Negative on Re-Schick*	*Per cent Immunized*
4–5	16	15	93.7	Old Diluted	46	40	87
6–10	202	163	80.7	Freshly Diluted	43	40	93
11–15	80	56	70.0	Undiluted (2 doses)	58	50	86
				Undiluted (3 doses)	33	32	97
Total	298	234	80.0	Total	180	162	90

diluted toxoid at weekly intervals gave 98 per cent immunes. For the physician who sees the child in his office this three-dose course should be the one of choice if the Ramon toxoid is to be used. Practically no reactions are obtained with this size dose. On the other hand, where the health officer and physician have to give the injections in the field, two doses of 0.5 c.c. and 1.0 c.c. undiluted toxoid or two doses of 1 c.c. of freshly diluted (1 to 1) toxoid, given at a 3-week interval may be recommended. With a potent toxoid, either with the two or three dose injection, at least 90 per cent immunes may confidently be expected.

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Resolution Adopted by the Research Committee of the International Association of Ice Cream Manufacturers, at its Meeting in Chicago on September 18, 1933

WHILE this committee fully realizes the importance of research in the matter of determining the bacterial count in dairy products, it deplores the fact that at times the results of such research are made standard practice, thereby resulting in different agencies using different methods. This committee wishes to go on record as strongly recommending that all agencies having to do with determining the bacteria count in dairy products adhere to the published American Public Health Association methods. The committee feels certain that the proper committee of the American Public Health Association will at all times be glad to entertain the results of research pointing toward the need of a change in their published methods.

Dr. Robert S. Breed, Chairman, Committee on Standard Methods for the Examination of Dairy Products, comments, in a letter to the Executive Secretary of the A.P.H.A., as follows:

Dear Doctor Emerson:

Thanks for your courtesy in transmitting the copy of the resolution adopted by the International Association of Ice Cream Manufacturers in Chicago, September 18, 1933. As Chairman of the newly organized Committee on Standard Methods for the Examination of Dairy Products of the American Public Health Association, I wish to emphasize the suggestion contained in this resolution that all laboratories following procedures in analyzing dairy products that they regard as superior to those outlined in the new (sixth edition) of *Standard Methods of Milk Analysis* (in press), transmit a description of these improved procedures to the undersigned. Such suggestions will receive careful consideration by the committee. It is only through the helpful coöperation of interested laboratory workers that this report is kept up to date.

If, on the other hand, laboratories find that they are following out of date recommendations, it is suggested that these procedures be brought into harmony with standard procedures as quickly as possible. Even where laboratories follow standard procedures closely, there are still enough discrepancies in counts obtained from duplicate

samples of milk and cream sent to different laboratories to give continued support to those interests that try to undermine confidence in bacterial counts by attacking their accuracy.

Plans are already under way for making an extensive comparative test of the suggestions that have been made that the standard incubation temperature be reduced from 37°C. to 32°C.; and that the composition of the agar be changed to one more suited to growing all types of bacteria known to occur in market milk and ice cream. It is hoped that agreement can be reached in regard to these matters before the next edition of the *Standard Methods of Milk Analysis* is prepared.

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VITAL STATISTICS

The **Incidence of Venereal Disease in the United States**—If the incidence of venereal disease can be reduced by adequate sex education, a large proportion of our population would be protected against a very important cause of mental deterioration. According to Vedder, 20 per cent of the young adult males of the population of the class from which the army was recruited are infected with syphilis and 5 per cent of the young men in colleges. The syphilis rate for the country is generally represented as 4.77 for the males and 3.07 for the females, with the highest prevalence among young adults twenty to twenty-five years of age. What is more significant for the welfare of the people is that syphilis permeates all strata of our population. The statistics of the American Social Hygiene Association, based upon blood tests, show figures varying from 1.4 per cent for farmers to 3.2 per cent for merchants and tradesmen, 6.1 per cent for laborers, and 11.7 per cent for railroad employees as recorded at the Mayo Clinic. Stokes and Brehmer assert that 26 per cent of syphilitics become infected between the ages of seventeen and twenty years and 32 per cent between twenty and thirty-five years of age. According to the studies of Newsholme, 10 per cent of all admissions to the state hospitals for the insane are due to general paresis. If syphilis is present in the general population to the extent of 10 per cent, the potential hazards to rational mental function are severe. To state that each year the United States presents a minimum of 679,000 new cases of gonorrhea and 423,000 new cases of syphilis is a sharp challenge to the intelligence of communities that employ every effort to educate the public concerning diseases like rabies, tuberculosis, and typhoid fever. These diseases are relatively negligible in their effects upon somatic and psychic well-being compared with the absolute and relative ravages of the venereal diseases.—*Mental Hyg.* 18:45 (Jan.), 1934. (Taken from *Sex Education in Relation to Mental and Social Hygiene*, by Ira S. Wile, p. 40–50.)

Vital Statistics for Maryland—A provisional summary of vital statistics for the State of Maryland in 1933 shows that 27,633 births were reported in the state during that year, as compared with 28,740 in 1932. The birth rate decreased from 17.2 in 1932 to 16.3 in 1933, the lowest rate on record. There were 21,464 white births and 6,169 colored. Of the total 27,633 births about 11 per cent were attended by midwives.

The general death rate continued the uninterrupted downward trend which has characterized it since 1928. In 1932 the rate was 12.6 per 1,000 population, and in 1933 it was 12.2. The white population had a mortality rate of 11.3 and the colored a rate of 16.5. Almost 70 per cent of the deaths occurred among persons 45 years of age and over.

The infant mortality rate for Maryland for 1933 was 64.9 per 1,000 live births, as compared with 69.5 for 1932. The low rate for 1933 is noteworthy because it is considerably lower than Maryland's previous lowest rate which was the rate recorded in 1932. In 1933, 1,149 white infants died as compared with 644 colored, making the mortality rate for the white infants 53.5 and for

the colored, 104.4. It is interesting to note that more deaths occurred during the first month of life than in all the rest of the first year, and that congenital malformations and diseases of early infancy caused 53 per cent of all the infant mortality. Of the 23 counties in the state, Queen Anne's (with an infant mortality rate of 120.2), Worcester (110.8), and Somerset (108.9), had the highest infant mortality rates and Carroll (38.0), Baltimore (44.8), and Howard (45.1), the lowest. There were 135 puerperal deaths in 1933 as against 144 in 1932. The maternal mortality rate per 1,000 live births for this year was 4.4 for white mothers and 6.6 for colored.

Analysis of the individual causes of death in 1933 shows that typhoid fever (with a death rate of 2.2 per 100,000 population), diphtheria (1.7), and tuberculosis (80.6), had the lowest mortality rates ever recorded for these diseases in Maryland. There were decreases for 1933 over 1932 in the mortality from measles which declined from 1.1 to 0.2, whooping cough from 5.4 to 4.9, influenza from 20.1 to 17.2, diabetes from 25.7 to 23.6, diarrhea and enteritis under 2, from 19.6 to 16.7; and marked reductions in cerebral hemorrhage from 112.6 to 95.1, and pneumonia from 103.5 to 93.8. Heart disease showed a very slight decline from 256.5 in 1932 to 256.0 in 1933.

Scarlet fever was the only one of the infectious diseases listed in the preliminary report, which showed an increase in 1933 over 1932, the rates being 2.3 and 1.9 for the two years, respectively. Nephritis increased from 138.5 per 100,000 in 1932 to 144.4 in 1933, and automobile accidents from 24.2 in 1932 to 25.4 in 1933.

Heart disease, nephritis, cancer, and cerebral hemorrhage were the leading causes of death in the State in 1933, and together they caused 50 per cent of the total mortality.—Maryland State Department of Health. Bureau of Vital Statistics (Jan. 15), 1934.

Statistics on Obstetric Operations in Hamburg, Germany—Statistics compiled by the public health service on obstetric operations performed in the city of Hamburg, Germany, reveal that in this city with a population of 1,100,000, a total of 5,391 births were completed with the aid of an operation, during the three years 1929–1931. Since, during that period there were 46,401 births (inclusive of stillbirths), there were 116.1 obstetric operations per thousand births. The figure 5,391 included 3,654 obstetric operations such as forceps delivery, version, extraction, embryotomy, perforation, induced premature birth and caesarean section, and also 1,737 cases with operative aid in such complications as hemorrhages, placenta praevia, eclampsia, and postnatal complications.

Compared with the prewar period, the number of births completed by operation shows a marked increase: for instance, during the period 1910–1911, a total of 3,488 obstetric operations were performed in Hamburg. These included the complications of the birth process but did not include aid given in hemorrhages, and represented 8.05 per cent of the total number of births. Aside from the birth complications, obstetric operations were performed in 2,854 cases, or in 6.50 per cent of the births.

The distribution of the obstetric operations has undergone a change as compared with the prewar period. Podalic version has declined to about half of its prewar frequency. Artificial induction of premature birth was not reported in 1929–1931 in a single instance. Embryotomy has increased from 2.1 per cent to 3.3 per cent. Caesarean section has increased to an even greater extent. During the period

1876–1880, caesarean section occurred only once in a thousand obstetric operations performed in Hamburg. In 1910–1911 the proportion increased to 13 per thousand; in 1929–1931 the proportion rose to 176 per thousand. For the most part, caesarean section was substituted for version. A period of fifty years has brought a 350 fold increase in the use of caesarean section. In the early history of the revived operation (for example, in 1881–1885), 75 per cent of the mothers succumbed to the operation; in 1910–1911, only 18.2 per cent; and the mortality has since decreased steadily.

The mortality of other obstetric operations has likewise declined, although not to the same extent. The percentage of stillbirths resulting from the use of forceps has changed the least (1910–1911, 6.0 per cent; 1929–1931, 5.1 per cent). With respect to version, the decline in mortality over this period has been something more than one-third (from 38.5 per cent to 24.5 per cent); as regards extraction, a little more than one-fourth (from 20.9 per cent to 15.1 per cent). Taking obstetric operations as a whole, the danger of a stillbirth has declined from 18.0 per cent to 13.4 per cent, or about one-fourth, which has been brought about chiefly through the improvement in the technic of caesarean section.

The complications of labor have become more frequent: 1910–1911, 1.45 per cent; 1929–1931 (without hemorrhages), 1.97 per cent. Various complications make up the increase, but particularly eclampsia which increased from 0.09 per cent to 0.34 per cent.

With respect to stillbirths, in 1910–1911, 61.5 per cent of the babies were born dead in association with placenta praevia; in 1929–1930, only 19.4 per cent. In eclampsia, the infant mortality has declined from 25 per cent to 12 per cent.—*J.A.M.A.* 102:224–225 (Jan. 20), 1934.

PUBLIC HEALTH ENGINEERING

THE AIR WE BREATHE AND THE SOUNDS WE HEAR*

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THE importance of the air we breathe with respect to public health warrants the serious attention being given to it in any consideration of the public health engineering problems of large communities. A person may live for weeks without food, and for days without water, but he cannot live more than a few minutes without air. For this reason, a continuous supply of air is more important to life than a continuous supply of either food or water. If we do not like the water or food at the place where we happen to be at the moment, we can wait for a reasonable period until some other source can be procured. But we do not enjoy this much latitude with respect to air. We have to breathe the air wherever we may be, and have no option in the matter.

A due recognition of these facts has led to a tremendous development of air conditioning apparatus in recent years. Devices for efficient and controlled heating, cooling, humidifying, and dehumidifying, as well as the removal of dust and other air impurities are now available for all types of buildings. This last summer a considerable amount of prominence was given to air filters for private homes for the prevention and relief of hay fever.

The construction of many of the buildings at "A Century of Progress Exposition" points the way to possible trends in the housing of the people in large communities. Advances in artificial lighting and mechanical ventilation have made possible the use of windowless buildings, providing comfort to visitors, and permitting a better utilization of wall space because of the lack of windows. The constancy of the lighting on exhibits as a result of this arrangement has been a large factor in reducing eye fatigue, which was so objectionable in many museums and expositions of an earlier day. Such windowless buildings would be out of the question were it not for the modern appliances available for maintaining the air in a condition conducive to health and comfort.

On the other hand, some buildings erected at the World's Fair have walls made entirely of glass. Here we have the two extremes—the windowless building and the house which might be called "all windows." Even in these glass houses, mechanical ventilation has been used to control the air conditions so that the windows need not be opened. In this way, better control may be maintained over the temperature and humidity of the air inside the building, and dust and odors may be excluded.

The provision of proper air conditions in buildings used as the homes and workshops of the people in large communities is far more than a mere mechanical or engineering problem. It

* Presented before the Public Health Engineering Section of the American Public Health Association at the Sixty-second Annual Meeting in Indianapolis, Ind., October 10, 1933.

is largely a social and economic problem as well. Complete air-conditioning apparatus cannot be afforded today by large sections of the population, so we must assure sufficient natural ventilation by judicious city planning, zoning restrictions on overcrowding of buildings upon the available land, and by suitable provisions in the building code regarding the size of windows, ceiling heights, and similar factors.

Another important consideration, especially in small homes, is the lack of any assurance that air-conditioning apparatus, if installed, would be maintained in an operating condition after the buildings became old and rundown. It is the experience of large cities that as soon as the profits from any building dwindle, the management is prone to economize by restricting the operating of ventilating equipment, and by failing to make the necessary repairs and replacements of essential parts of the equipment as they wear out.

For this reason, it is my opinion that public health engineers should oppose efforts to substitute mechanical for natural ventilation in small dwellings. It is probable that large buildings can make use of artificial air supply and lighting for interior rooms to advantage when the high achievements of these two arts are considered.

The air in factories and workshops is subject to contamination with many substances, some of which are dangerous to life. There is a tendency to use new materials and processes which offer the prospect of lower production costs and increase profits, without first taking the time and trouble necessary to determine what effect the change will have upon the health of the workmen exposed to the new substances. Frequently, definite information upon the physiological reaction of an individual to a substance is sadly lacking, and the manufacturer does not know where to turn for authoritative information. Under these circumstances, he is likely to assume that there is no hazard and commence use of the new material.

Not infrequently the toxic effects are slow in making an appearance, whereby they may be recognized, and a false sense of security may be built up, as was the case with methyl chloride in domestic refrigerators. We have found that very small concentrations of other halogen compounds, such as carbon tetrachloride for example, may be toxic to workmen exposed to them for 7 or 8 hours a day over considerable periods. The amounts of these substances which produce illness are very much less than the toxic limit as given in the literature based on experiments involving only a short exposure.

The great strides which have been made in chemistry in this country during and since the war have made available to our manufacturers a wealth of substitutes for toxic materials, so that today there is little excuse for any industry to use substances that are highly toxic to the workmen. For example, in many places, xylol, toluol, and petroleum distillates have been substituted for benzol as a solvent for rubber, lacquers, enamels, and other substances. Titanium oxide and lithophone are being substituted for the more toxic lead in paints in order to reduce the hazard of lead poisoning.

One danger to be guarded against, is the possibility that unforeseen conditions may create a wholly unexpected health hazard against which no protective measures are being taken. For example, a recently developed refrigerant, dichlorodifluoromethane, has been declared by its users to be ideal because of its inert character and its favorable physical characteristics, such as the boiling point. This material may decompose in the presence of a flame, forming the dangerous gas, phosgene. A carbon tetrachloride fire extinguisher

if used in an atmosphere poor in oxygen may permit the formation of the same substance. Public health engineers must learn to recognize the possibilities of such occurrences and to guard against them.

It may be that studies now being made and the example set by the exhibit buildings at the World's Fair may result in a new conception of housing people in great cities. The use of new materials and new adaptations of old materials, together with the emphasis upon plain, unadorned surfaces, the use of color, and the relation of masses may have a decided bearing upon the architecture and mode of construction of the homes and workshops of the future.

It is probable that people would be better housed if cheaper and less permanent forms of construction were employed for erecting houses having a useful life of 10 or 15 years. The advances to be anticipated during the life of the buildings would warrant their demolition at the end of that time, and the erection of new, more healthful, and more comfortable dwellings in their place. Of course, the financing of such a scheme would be dependent upon reduction of costs, and perhaps also to some extent upon factory fabrication, as well as mass production.

The public health engineer is eminently fitted by training and experience to take a leading part in such a movement, with the object of removing existing insanitary and unhealthful dwellings and replacing them with houses where health may be properly safeguarded at little or no additional cost. A danger to be guarded against is the sweeping aside of health considerations in an effort to cheapen buildings. This must not be permitted, as it is false economy, penny-wise and pound-foolish, and the members of this Association should be on the alert in their own communities to detect trends in that direction and combat them with every means available.

There remains the question of outdoor air. When one travels from the uninhabited mountain peak or primeval forest to a city, he expects to encounter an increasing amount of air contamination, even outside of buildings. Heating plants, chemical and fertilizer factories, packing plants, steel mills, oil refineries, smelters, coal yards, cement mills, restaurants, power houses, railroads and steamships, all contribute their quota of smoke, ash, dust, fumes, gases, and obnoxious odors.

Some of these materials affect the human body directly, such as arsenic compounds from smelters and foundries, acids from metal plating works, and sulphur compounds from many sources. Perhaps the most widely known example of this direct action is the poisonous fog which settled in a river valley in Belgium in December, 1930, and caused 65 deaths. Investigation revealed that these deaths were due to sulphurous anhydride gas from a nearby industrial district. That occurrence received widespread attention because of its dramatic suddenness and the imaginative theories expressed in the newspapers connecting it with hidden stores of war gases.

The higher pneumonia death rate in urban than in rural districts has been blamed by some upon the inhalation of toxic substances in the air, which contribute to a premature death as surely, if not as quickly, as in the Belgian incident.

At the Fort Worth meeting of this Association, Dr. Fred O. Tonney and Clarence R. De Young [1] described the correlation between pneumonia deaths and ultra-violet radiation in the sunlight, showing that a decrease in actinic rays was followed, a month or two later, by a corresponding increase in the pneumonia death rate. It is possible and even probable that the

increase in contamination of the air by smoke and ash, which serves to cut down the ultra-violet light in winter, also affects the individual directly, thereby having a double-barrel effect upon the unfortunate victim.

When one considers that great attention is paid to the purity of water, milk, oysters, and other food, while the amount of gaseous and solid waste discharged through chimneys and stacks has largely increased with the growth of cities and industries, it is easy to see how greater amounts of harmful substances may enter our bodies in the air we breathe than in the food and water we swallow. Many people do not realize that from 4 to 7 times as much air, by weight, enters our bodies, as food and water combined.

The effect of air contamination upon our greatest natural germicide, the sunlight, is doubtless an important factor in the spread of common communicable diseases during the winter. Of course, the rôle of sunlight in preventing rickets is too well known to need comment here. In spite of the ease with which rickets may be prevented, it is still too common, and sometimes found where you would least expect it.

Contamination of the air with carbon monoxide on and adjacent to heavily travelled boulevards and streets is a factor to be reckoned with in promoting vitality and adequate resistance against disease. Only those who suffer with hay fever fully appreciate the importance of keeping out-door air free of irritating pollen by destroying weeds before they pollinate.

Smoke has created another hazard to life since the birth of aviation, namely, the poor visibility over cities where air lines center. A great deal of discussion has occurred in Chicago, for example, as to the feasibility of creating an airport on the lake front near the heart of the city, the greatest drawback to the proposed location being the poor visibility occasioned by smoke. Thus far this objection has been serious enough to prevent undertaking the project.

Many devices are in use to reduce the contamination of out-door air. Some aim at more complete combustion of fuel to eliminate soot and black smoke, but do not always prevent blowing large amounts of ashes and fine cinders from the stacks. Other devices reclaim valuable products from the gases emanating from such places as refineries for precious metals and smelters. These may be various forms of filters or Cottrell precipitators, using the well known repellant action of similar electrically charged particles. Washers and scrubbers are widely used for removing dust and acid fumes, and chlorination has been used successfully to control objectionable odors from garbage reduction plants and similar places.

One other form of health menace reaching us through the medium of the air remains to be considered briefly—noise.

The growing mechanization of industry and transportation, and the development of radios and amplifying systems have greatly increased the noise of which large communities are victims. This problem must be considered in two sections: (1) the noisy industries where re-design of machinery for more quiet operation is possible; and (2) community noises which are the sum-total of many minor noises.

The former can be minimized by properly directed industrial hygiene work, pointing out to employers the losses of accuracy and efficiency occasioned by a noisy environment, the high cost of replacing employees unable to stand the continued wear and tear on their nervous systems, and the losses due to deterioration of machinery.

Studies have indicated that the cost to an industry of replacing even a common laborer is $25, and this cost rises

rapidly with the degree of skill required of the employee. Added to these direct costs to industry, there are the burdens imposed upon all taxpayers for the maintenance of institutions for those suffering from nervous and mental diseases. These conditions are particularly affected by noise.

The second classification of community noises can better be dealt with by education of the public as to the benefits accruing to themselves and their neighbors as the result of maintaining a reasonable degree of quiet. Certain things, such as the sale and discharge of fireworks, may perhaps be controlled by laws; but there are so many other sources of noise which are parts of the grand total that it would be impracticable to make and enforce laws to prevent all of them. Therefore, education is the principal weapon to be used in fighting them.

That the public is becoming noise-conscious is reflected by advertisements of apartment buildings which stress the fact that the building is sound-proof rather than the desirability of location or other features calculated to attract tenants. An article appeared a few days ago in a large metropolitan newspaper headed, "Court O.K's Purchase of Silent Cars." This item stated that the court had authorized the receiver for a street car company to purchase some new cars, and the feature of these believed by the newspaper to be most interesting to the public was the quietness of their operation.

It is my opinion that there will be an increasing amount of attention given in the near future to preventing unnecessary noises at their sources by better design of machinery and switching from noisy to quiet operations, as, for example, from riveting to welding of steel structures. In this movement, too, the public health engineer should take an active part to stimulate progress along the proper lines and assure that the nervous systems of our people are given as much consideration as their freedom from communicable diseases and protection against the hazards peculiar to childhood.

CONCLUSION

There is danger that we may become hopeless and apathetic toward the hazards to health involved in conditions of the air, such as noise and contamination by toxic and otherwise objectionable substances, both inside and outside of buildings, because of the immensity of the problems and the rapidity with which new aspects arise with the development of new processes and industries.

Although progress has been made in some directions, the degenerative diseases stand out as unconquered obstacles to attaining the aim of public health work, prolonging life and making it richer, more useful and happier while it lasts. How much of these degenerative diseases can be prevented by improvement of the environment may be difficult to predict, but there is no lack of medical authorities who suspect a connection between lung cancer and the tar in soot. Nephritis is doubtless promoted by the toxic substances absorbed during the course of early and middle life, even though it may not definitely develop until later. It is safe to say that continued progress in public health protection must include some measures directed against the present principal causes of death.

We must bring to bear on these problems of the atmosphere the same careful thought and investigative attitude that have been responsible for the outstanding progress made in some other lines of health protection, such as in treatment of water supplies or reduction of infant mortality. We must keep ever before us the fact that the health hazards present in the air we breathe affect the entire population regardless

of age, and in this respect they transcend in ultimate effect those dangers limited to any one group or age.

Two things appear to be outstanding needs of the moment—(1) more authoritative information and (2) education of the public in order to secure enthusiastic and voluntary coöperation in the reduction of the health hazards. Fundamental data such as those collected by the U. S. Public Health Service, Mellon Institute, New York Commission on Ventilation, American Society of Heating and Ventilating Engineers with the United States Bureau of Mines, the National Safety Council, and the Local Safety Councils, the American Society of Mechanical Engineers, the Acoustical Society of America, this Association and others, are greatly needed, to envisage the seriousness and extent of the problems and to point out the most effective and economical solutions. The former lack of uniformity of opinion about the relative merits of natural and mechanical ventilation in schools and similar locations is just one example of the need for more extensive and complete information, and facilities for interchange of views.

This Association should endeavor to stimulate the collection of such needed data and use its influence to encourage research work by public health agencies and other institutions and the financing by industries of studies relating to the health of their workers, neighbors, and the consumers of their products.

Effort to improve housing, both through the Public Works Administration for the relief of unemployment, and in other directions where such agencies are not operative, should be definitely promoted by the Association as such, and by the Fellows and members as individuals. New life should be injected into the campaign to secure an alert and informed public opinion to assure that the scientific data obtained is made effective in its application to health problems of communities, large or small. We should first devote our own zeal to the work and then get all of our fellow citizens to do likewise.

Only in this way can we hope to do more than scratch the surface of the serious and increasingly complex health problems presented by air conditions in the great urban centers in which so many Americans have chosen to establish their businesses and homes.

NOTE: This is the final article from the Symposium on Public Health Engineering Problems of Large Communities (see this *Journal*, Jan., pp. 64–67; Feb., pp. 108–121, and 158–160).

REFERENCE

1. Tonney, Fred O., and De Young, Clarence R. Smoke Eradication to Save the Health Value of Urban Sunshine. *A.J.P.H.* 21, 4:344 (Apr.), 1931.

INDUSTRIAL HYGIENE

New Clinic for Occupational Diseases—New York University and Bellevue Hospital Medical College has opened a special clinic for occupational diseases, with a laboratory equipped for the work. Cases of lead poisoning, silicosis, occupational dermatoses and benzene poisoning have already been handled in the clinic, which meets Wednesday afternoons. Physicians and industrial health workers have been invited to refer cases.—*J.A.M.A.* 101, 26:2057 (Dec. 23), 1933. E. R. H.

Tercentenary of the Birth of Bernardino Ramazzini — The entire monthly issue of *Rassegna Della Previdenza Sociale* (Anno XX, N. 10, Oct., 1933, 114 pp.) is devoted to the papers and reports connected with the celebration of Ramazzini's birth—"the father of industrial medicine." Papers were presented by the following professors: Luigi Devoto, Cesare Biondi, Luigi Carozzi, Giuseppe Francioni, Cesare Giannini, Giovanni Lorica, Giuseppe Marangoni, Giovanni Mauro, Antonio Mori, Gaetano Pieraccini, and Gustavo Pisenti. The celebration was held at Milan on October 4, 1933. The papers all pertained to the different activities of Ramazzini, who, in some respects, apparently lived some 300 years in advance of his time. E. R. H.

VII International Congress on Industrial Accidents and Diseases, Brussels, 1935—Announcement has just been received from Dr. L. Dejardin, Secretary-General, of the plan to hold this Congress in mid-July, 1935. As customary it will be divided into two sections representing the International Congress on Industrial Accidents and the similar Congress on Labour Medicine, both meeting together. Chairmen, so-called "Presidents," have been set up for the various countries who are to proceed to give publicity to the Congress and to organize delegations to attend. Emery R. Hayhurst, Ohio State Health Department, Columbus, has been designated Chairman for the American Delegation for the Section on Industrial Diseases and those interested should communicate with him directly.

E. R. H.

Robert Prosser White, M.D., Edin. (Obituary)—Dr. Prosser White, who died at Southport on Jan. 4 at the age of 78, had won for himself an international reputation in industrial diseases. He took his medical degree from Edinburgh University in 1878. He was appointed a certifying factory surgeon in August, 1896, and published a paper on nitro- and dinitro-benzol poisoning at that time. An appointment as physician in charge of the skin department at the Royal Albert Edward Infirmary gave him first-hand knowledge of the skin affections associated with the local industries, and in 1915 he published the first edition of his work on "Occupational Affections of the Skin" which appeared as a greatly enlarged edition some 10 years later. He was an Associate Editor of the *Journal of Industrial Hygiene*. He possessed a large capacity for work, and maintained his keenness throughout a long life; he did not regard himself as a great clinical dermatologist, but rather as a collector of information. It was thus that he started in October to attend the tercentenary celebration in Milan of the birth of Ramazzini, whom he admired

for his spirit of adventure and inquiry. Ill health prevented his attending this celebration, but the substance of his address appears on page 114 of the *Lancet* for January 13, 1934. He gave to the library at Wigan, his native town, a number of sixteenth and seventeenth century works on dermatology and the occupational diseases.—*Lancet*, 5759: 111 (Jan. 13), 1934. E. R. H.

Tenth Anniversary Moscow Institute of Professional Diseases—This celebration is in the name of V. A. Obuch. The Institute was founded by the Section of Common Health of the Council of Moscow, July 23, 1923, being the first of its kind in the Union. The Institute studies systematically the professional diseases in the industries of Moscow for the purpose of promoting industrial hygiene, improving the general health through the organization of medical and prophylactic work, the listing of properly skilled physicians, and education procedures.

During the ten years of its existence, the Institute published 32 collections of its works and 690 articles, some appearing abroad, also a series of pamphlets, leaflets and placards.

At present, the Institute has the following divisions: (1) Professional Hygiene for studying special branches of industry, each of which has its doctor of hygiene, promotes the selection of proper workers, etc. A comprehensive laboratory is provided for research and tests. (2) A Clinic, having 250 beds, also has laboratories and relates clinical findings with industrial influences. One section with 30 beds, called a half-way station, permits aptitude tests. Another section, with 25 beds, specializes in the selection of young workers. (3) The Physiological Laboratory is one of the largest in the Union. This concerns itself with both the theoretical questions of industrial physiology and those of experimental toxicology.

The various industrial plants are represented in the Institute where workers also take an active part in the deliberation of questions extant.

"Informing you of its anniversary, the Institute hopes that this celebration will serve to unite the specialists of (the) professional hygiene and pathology working in the different countries." The statement is signed by Arnautoff, as Director of the Institute, and Smirnoff, as President of the Jubilee Commission. E. R. H.

Japanese Institute for Science of Labour, Annual Report, 1932—This lists researches finished in 1932 such as environmental conditions, rationalization of labour, fatigue researches, qualification of workers, and occupational diseases. There follows a list of lectures and reports at various meetings and congresses.

The bulk of the report is devoted to abstracts of papers published in *The Journal of Science of Labour*. There is also published a Japanese Year Book of Social Hygiene, while 5 of the major papers published in 1931 and 9 of those published in 1932 have been translated into English and German, and appear in the Journal of the Institute. Some of the workers have been students in American educational institutions.—Gito Teruoka, Director, Kurasiki, Japan, July, 1933, 25 pp. E. R. H.

Report upon the Work of the Miners' Phthisis Medical Bureau for the Three Years Ended 31st July, 1932—This is an extensive, long page, closely printed report with tables and schedules, too extensive to abstract, but treated under various subjects such as: pathological and other investigations, the exactions required in the examination of workmen having in view compensation matters, silicosis (with an extensive discussion), likewise tuberculosis, benefits and beneficiaries, Euro-

pean and native laborers, etc. The report is by Dr. L. G. Irvine, Chairman.—Union of South Africa, April 13, 1933, 62 pp. (Procurable from the British Library of Information, 270 Madison Avenue, New York, N. Y., price 3s. 6d. Code U. G. No. 22, 1933. 3804—3/6/33—750.) E. R. H.

Abstracts of the Reports of the Institute of the Science of Labour, Japan—These abstracts are rendered in English and are taken from the *Journal of the Science of Labour,* Vol. 5, No. 1–5, first half of 1928. The pamphlet (9 pages) abstracts 17 papers pertaining to the physiology of the worker, the effects of the environment upon him, intelligence tests, and measurement of norms.—Kurasiki, Japan (received 1933). E. R. H.

Eighth Annual Report, Ontario Department of Health, for the Year 1932 (Industrial Hygiene Branch)—The personnel of the Industrial Hygiene Branch consisted of a Director, Clinical Specialist, Special Research (Worker), Chemist, and Chief Sanitary Inspector. The demands upon the facilities of the Branch or Division have considerably increased in spite of industrial unemployment, due no doubt to the emphasis upon sickness from the economical standpoint and that labor turnover is reduced to a minimum. Also, voluntary health work by employers has but seldom been discontinued, which would suggest that the procedure rests upon a sound basis.

Special discussion pertains to: (1) ventilation, in which it is found that overheating in winter is the most common failing; there is no satisfactory evidence to support the claim that increased humidity has a beneficial effect on healthy people, while there are also no data showing a relation to exist between the incidence of sickness and ventilation conditions, so that the use of sickness experience as a general indication of ventilation appears not to be warranted. (2) Occupational diseases, at the last session of the Legislature, are required to be reported by all physicians and to the Provincial Department of Health, where it has been found that thus far suspected cases of lead poisoning and silicosis predominate. (3) Surveys made of trades or occupations with exposure to silica dust, particularly foundries and vitreous enamelling, also the examination of rubber workers exposed to talc dust, others exposed to marble dust, the examination of 168 contacts (wives and children) of miners with silicosis and tuberculosis, with direct evidence of spread; the examination of a rubber shoe factory with the suggestive evidence that the inhalation of fumes of gasoline or like solvents assists the development of tuberculosis; and the increased physical examinations made necessary through the new regulation of the Factory Act. (4) The control of dust and fumes with caution in regard to the installation of ineffective equipment, also the surveying of the potential hazards in a considerable number of plants in various industries. (5) The work of the industrial hygiene laboratory—estimation of the amount of lead in the air, autopsies, the discovery that in a number of incidences neither the employer nor the employee was aware of the constituents of hazardous materials used. (6) First-aid and health posters. (7) Fumigation with cyanide compounds, attended with 6 fatalities during the year. (8) Sanitary inspection, particularly in relation to lumber, timber, and mining camps.

A separate leaflet embodies regulations of the Factory, Shop and Office Building Act, adopted Sept., 1932, particularly pertaining to the industrial use of benzol and lead and requiring that all manufacturers, distributors, employers, using substances dangerous to

health "when required by the Chief Inspector of Factories on advice of the Director of the Division of Industrial Hygiene, must post in a conspicuous place printed forms to be approved by the Department of Health setting forth these dangers and indicating the precautions necessary for the protection of their employees."—Dr. J. Grant Cunningham, Director, Division of Industrial Hygiene, *The Report*, pp. 36–40 (plus leaflet mentioned). E. R. H.

Occupational Poison and Disease Statistics, New York State Division of Industrial Hygiene, Jan.-June, 1933—This typewritten report comprises 3 tables, the first of which shows the make-up of the 402 claims from New York City and "Up-State"; the second, the causes arranged in alphabetical order by months; and the third, the leading causes, in a general summary. Of the 402 cases, 20 had a doubtful classification, and 58 were not in the schedule (of compensable diseases). The leading causes in the compensable list were, with cases, lead, 40; benzol, etc., 39; carbon bisulphide, 10; tetrachlorethane, 14; chrome, 9; carbon monoxide, 17; acids, 9; petroleum products, 13; friction, 17; dermatitis, 141 (acids 5, alkalies 70, oil 45). Notable causes in the non-compensable list were: carbon tetrachloride, 7; dermatitis, non-scheduled, 21; diseases, non-scheduled, 19; dyes, unspecified, 9; dyes, specified, 7; hydrogen sulphide, 10; lacquer, 5; poison ivy, 35 (possibly scheduled); trisodium phosphate, 4; turpentine, 4.—J. D. Hackett, Director, 40 Centre Street, New York City. E. R. H.

Child Labor Under the N. R. A.—The National Recovery Administration has adopted the principle that a 16-year minimum age for full-time employment should prevail throughout industry. Over a hundred permanent codes of fair competition have been approved and were in effect by November 15, 1933. These include many important manufacturing and mining industries and most of the retail dealers. The codes prohibit the employment of children under 16, with the exception of the general retail code which permits children between 14 and 16 to work part time outside school hours; 18 has been fixed for a number of dangerous industries or for certain hazardous processes. Through these codes a real beginning has been made in restricting child labor. Much, however, remains to be done, particularly in securing a more complete coverage of dangerous occupations by the higher age standards. Furthermore, certain forms of child employment—*e.g.*, in street trades, domestic service, and commercialized agriculture—will be difficult to regulate under the National Recovery Administration.

The article details further relationships of this question as regards various trades, vocational guidance, legislation, etc.—U. S. Children's Bureau, *Child-Welfare News Summary* (Nov. 24), 1933. 8 pp. E. R. H.

Sickness Among Male Industrial Employees in the Third Quarter of 1933—The reports of industrial sick-benefit associations show a lower rate of sickness causing disability for 8 consecutive days or longer per 1,000 men during July, August, and September. The rate was 65.3 as compared with 77.0 in the third quarter of 1932 and 88.8 in the corresponding quarter of 1929. Both respiratory and non-respiratory diseases were decreased, in the quarter under discussion.—Dean K. Brundage, B-268, U. S. Public Health Service, 3 pp. E. R. H.

Insulation Against Heat and Cold for Human Comfort—A study was made of the uses of bright metallic surfaces since they reflect much of the

heat they receive. The method of insulation also took into consideration the low heat-conducting properties of air and the fact that an air-proof material hinders the passage of heat by convection currents. Briefly, the insulator is a sheet of reinforced aluminium foil—*i.e.*, material covered on both sides with aluminium foil—fixed so as to divide the air space across which the transference of heat is to be hindered. Laboratory tests were first made at the London School of Hygiene and Tropical Medicine and then followed up for practical experiences in Egypt, also on ships, and in tents, trains, and ambulances. A tropical helmet was devised which also proved its efficacy.—G. P. Crowden, *Lancet*, 5758:37–40 (Jan. 6), 1934.

E. R. H.

Report of Industrial Hygiene Committee, State and Provincial Health Authorities—The control of occupational diseases is fundamentally a public health problem. The efforts of public health organization, it should be appreciated, will be rendered less effective unless adequate attention is given to the large groups of industrial workers. The relations are significant in regard to the so-called "degenerative diseases," and the influence upon same of dangerous or unwholesome environment. Evidences to this effect are noted by Dublin in the mortality experience of this group in which, *e.g.*, it is shown that a 20-year old worker engaged in the non-hazardous occupations has a life expectancy seven years longer than the "industrial worker" beginning at the same age.

The industrial hazard situation may be said to simulate an epidemic with the focus of infection in the contaminated workroom. Just as public health authorities have learned the necessity of providing well trained men to locate and eliminate the source of an epidemic, a no less well organized bureau should be considered for the elimination of the source of the occupational disease. The importance of the subject is manifested by the growing interest in industrial hygiene in the various states, such as the adoption of codes specifying the maximum amount of toxic material to which workers may be exposed. Likewise a number of universities have seen fit to provide special courses in industrial hygiene.

Any program for the control of occupational diseases necessitates:

1. Reporting and investigation of cases.
2. A comprehensive knowledge of the effects upon health of materials and processes used in industry.
3. Physical and chemical determinations of industrial environments.
4. Laboratory facilities.

The health department, made up of its different types of workers and functions, provides the basic facilities and technical staff necessary for the control of occupational diseases.

The industrial hygiene activities of health agencies was inquired into by means of a questionnaire with a summary by states, including Connecticut (surveys, special studies, and lists of hazards); Indiana (a brief statement of some limited investigations by the Division of Industrial Hygiene); Michigan (discontinuance of its Bureau of Industrial Hygiene due to lack of funds); Mississippi (health and educational program); Ohio (suggestion of points to be stressed); Ontario, Canada (with brief statement of its major activities); Rhode Island (liaison with the factory inspector and the contemplation of organizing a Division of Industrial Hygiene).

The American Public Health Association has 8 committees active in industrial hygiene (consult annual *Year Book* for reports). The U. S. Public Health Service, through its Office of Industrial Hygiene and Sanitation, lists a number of important activities.

A brief discussion follows by certain states.—Stanley T. Osborn, Chairman, *The Proceedings*, 47th Annual Meeting, Washington: 149–155 (June 2–3), 1932.

E. R. H.

Ventilation, Sunshine, and Clothing—This is a comprehensive article based largely upon animal experiments, including guinea pigs, rabbits, pigeons, and monkeys, and the conclusion was reached that properly fed animals remain remarkably free from disease under various environmental conditions, while improperly fed animals, however well kept, are remarkably subject to it. Heat-stroke and its avoidance was a feature of investigation as well as control of epidemics by ventilation, such as the spreading apart of beds and opening the windows of dormitories as advocated by Captain S. F. Dudley. Thus infection cannot be stopped by isolation of the sick; but it can be enormously reduced by good ventilation. The cubic space of a room is of no importance; it is the ventilation which counts. The dusty, warm atmosphere of crowded rooms not only spreads infection but lessens the defence of the membrane which lines the breathing passages. Every sedentary worker can devote some of his spare time to open air exercise.—Leonard Hill, *Lancet*, 5747:933–936 (Oct. 21), 1933.

E. R. H.

Occupational Disease Hazard of Silicosis in Construction Operations and Its Prevention—This paper is based on approximately eight years' definite personal study of the effect of underground dusts on health and safety, supplemented by about 25 additional years of close attention to data and studies made by others. The author has conducted intensive study in more than 100 coal and metal mines and in scores of mining communities in twenty-five states, first as a mine surveyor, then as a coal mine superintendent, and finally with the U. S. Bureau of Mines. The subject is handled from an engineering viewpoint which has convinced him that "stop the dust" is the only feasible solution.

The general physical characters of dust, pathological relationships, the various hazardous operations, the futile and often very expensive installations made by well-intentioned employers, the comparison of foreign experiences, and the fact that after all the real solution lies with the engineer, are all discussed. Rules are laid down for the best procedures and certain citations were made from current literature. A very extensive bibliography is appended, classified as to sources of material, particularly along engineering, mining, metallurgical and related lines.—D. Harrington, 13 pp., from address presented before Construction. Section, National Safety Council, Oct. 2, 1933, published by U. S. Bureau of Mines (not coded).

E. R. H.

Silicosis—This pamphlet, profusely illustrated, aims to present to manufacturers a brief description of the disease, its causes and complications, and a more detailed discussion of measures designed to prevent its occurrence.

There are included: industries and processes using silica, a table showing the uses of silica, and the types of silica used in each; harmfulness of silica dust; dust determination; standards of dustiness; how silica reaches the lungs; symptoms and diagnosis of silicosis; the complication with tuberculosis; classification by stages; prognosis; and preventive measures.

The last subject is given special emphasis under the head of protective devices, good housekeeping, medical supervision, the practical application of local exhaust equipment, of segregation and special equipment, and plant surveys. A selected bibliography fol-

lows.—Industrial Health Section, Met. Life Ins. Co. 1933, 32 pp. E. R. H.

Lead-Poisoning, Legislation and Statistics—This bulletin reviews legislation and statistics for lead poisoning in several foreign countries as well as in the United States, and should be consulted in the original for the many valuable deductions made. It is replete with tables and a considerable number of case reports. The statistics pertain to the years 1930–1931, and were partly derived from a questionnaire. The recorded deaths from lead poisoning in the United States for the year 1930 was 99. There is included also a reference to the Reports of the Committee on Lead Poisoning, A.P.H.A., which appear in the annual *Year Book* and elsewhere in the *Journal* for the last several years. The author was Chairman of the Sub-Committee on Statistics of this Committee. The concluding portion of the report is the translation of the report of the Swiss Accident Insurance Society (Director Tzaut), made to the Federal Commission on Lead-Poisoning, May 7, 1929.—Frederick L. Hoffman, Consulting Statistician, Prudential Insurance Co. of America, Newark, N. J. 1933, 40 pp. E. R. H.

"Industrial Medicine"—The September, 1933, issue of this new publication (Vol. 2, No. 3) comprises pages 145–204 with table of contents, major papers, industrial hygiene digest, announcements and news.

The major papers comprise the following:

Occupations of Antiquity, by Robert T. Legge (University of California), which in particular discusses the earliest known mention of the various metals and where found, and the earliest references to occupational diseases. The author considers the earliest dangerous trades to have been implement and armor making, the construction industry, husbandry and agriculture (a brief paragraph), the bronze age, metallurgy and mining, the glass industry, and pigments and cosmetics. The article also reviews primitive surgery and industrial hygiene and concludes that the latter subject has been a progressive one and did not "begin with the invention of the steam engine."

"Compensable Back," by Dr. John D. Ellis—the technic of examination; exaggeration and malingering.

Psychology of Trauma, by Dr. Jewett V. Reed (Indianapolis)—classification under the heads of malingering, neurosis following trauma, and mistaking the cause and effect.

Carbon Dioxide—An editorial summary covering its hazards and uses.

Health and Business Recovery, by Dr. Hart Ellis Fisher, Chicago Rapid Transit Company.

One Hundred Books for the Doctor—A special selection of recent titles.

Coal for Industrial Hygiene, by Dr. Dean K. Brundage, Statistician, U. S. Public Health Service.

Vocational Rehabilitation—Its History and Scope of the National Program, by John A. Kratz, chief, Vocational Rehabilitation, Federal Board.

There are also many important fillers. E. R. H.

Papers in The Industrial Bulletin, New York Department of Labor, Aug., 1933—

The Next Step in Industrial Hygiene—A brief discussion to the effect that there must be a vigorous application of hygienic ideas in industry and especially that relating to the control of dust, fumes and gases at their points of origin.—J. E. Hackett, Sept. issue, p. 200.

Lead Poisoning and the Depression—Essentially a discussion of the nature of lead poisoning and the fact that along with the modernizing of public and industrial institutions must be considered

the inclusion of advanced methods in the protection of workers against lead poisoning.—May R. Mayers, Sept. issue, pp. 201–202.

Review of Silicosis, Part V—The prevention, dust estimations, and educational procedures necessary to cope with this hazard.—Adelaide Ross Smith, Sept. issue, pp. 224–226.

Corrosion in Exhaust Systems—A discussion of the electrolytic and acid theories, illustrated, along with methods of testing materials for equipment in advance of their usage.—John H. Vogt, Oct. issue, pp. 252–254.

Review of Silicosis, Part VI—Silicosis compensation in the United States and requirements of an adequate silicosis compensation law. Under the latter heading, the necessity for a definition of silicosis and its stages, eligibility for compensation, diagnosis by expert authorities, and the amount of compensation.—Adelaide Ross Smith, Nov. issue, pp. 308–309.

1932 Directory of New York State Manufacturers, Volume II, Metropolitan Area—This is procurable from the New York State Department of Labor, 80 Centre St., New York City, Directory Division, price $5.00.

Skin Diseases in Industry—Case citations and general discussion.—May R. Mayers, Dec. issue, pp. 314–315.

Carbon Monoxide Poisoning and Compensation—Case citations regarding a truck driver, also a garage worker, who were exposed to high concentration of the gas.—May R. Mayers, Dec. issue, p. 315. E. R. H.

FOOD AND NUTRITION

Is Salmonella Food Poisoning Caused by Living Bacilli or by Thermostabile Toxic Products?—Eight human volunteers ate custard cultures of *S. enteritidis* or washings from such cultures, the cultures and the washings having been heated or filtered so that supposedly they no longer contained living organisms.

One volunteer swallowed a few living organisms in the heated washings, but was not made ill. Another ate custard that, by mistake, had been heated insufficiently to kill large numbers of the contained organisms, and this subject developed symptoms of severe food poisoning. Nine monkeys were fed with *S. enteritidis* in living suspensions, heat-killed cultures or sterile filtrates. Symptoms of gastroenteritis occurred only when living organisms had been fed. Heated and filtered cultures of enteritidis strains produced no symptoms of food poisoning when living bacilli were not present.

The results provide weighty evidence in favor of living bacilli, rather than thermostabile toxic products, being the cause of Salmonella food poisoning. The smaller the number of organisms swallowed the longer is the period of incubation. The first sign of illness in both man and monkeys was the development of diarrhea. Cultures of diarrheal stools were practically pure cultures of the swallowed organism, indicating that *S. enteritidis* had supplanted the normal fecal flora. As the symptoms subsided the fecal flora gradually returned to normal.

While enteritidis strains apparently differ in their ability to produce symptoms of food poisoning when fed, it seems probable that when one is working with a single strain, it is the number of living organisms and not their products or the nature of the suspending menstruum that is important.—Elizabeth Verder and Charles Sutton, *J. Infect. Dis.*, 53:262 (Sept.–Oct.), 1933.

The Occurrence and Origin of Lead in Canned Sardines—In routine examination of canned sardines the authors have found metallic impurities —both tin and lead. The tin content is generally 0.1 to 0.2 gr. per lb. The lead content is variable and considering its health aspect the figures submitted are significant.

Out of 596 samples examined, 37 per cent contained from 0 to 5 p.p.m. of lead; 32.6 per cent contained from 6 to 10 p.p.m., and 18.8 per cent contained from 11 to 20 p.p.m. Approximately 9 per cent of the samples showed a range between 20 and 40 p.p.m., and at the extreme range 3 samples contained between 71 and 80, 1 sample between 81 and 90, and 1 sample 150 p.p.m.

The general assumption has been that the lead was derived from solder on the cans. There are three possible sources of contamination: (1) natural lead content of the fish; (2) methods of packing, including the use of solder for sealing, and (3) contamination due to the method of preparation. Raw sardines were found to contain no lead. Samples showing excessive exposed solder compared to those showing little solder, and to those with "sanitary" seals where no lead is present, showed no correlation between the exposed lead or the absence of lead and the amount found in the fish.

There are two methods of preparation—the French method and the Portuguese method, both consisting in cooking the sardines on metal grills. In the French method the cooking is done with hot oil and the Portuguese method by means of a steam-chest at a temperature of 110°C.

Examination of the metal grills showed that they were tin-coated but the coating contained large amounts of lead—in fact, practically representing soft solder. Sardines cooked on old grills showed 44 to 57 p.p.m. of lead, but fish on the grills newly tinned with block tin showed 7 to 10 p.p.m. It was found also that there is greater contamination from the steam cooking than when cooked in oil.

The authors definitely ascribe the contamination in canned sardines as traceable to the metal grills, although, of course, in some instances there may be a contributory addition where there is exposed solder in the cans. Two methods were used—the chemical method and the photospectrometric method. Figures are appended showing very close check between these two methods when known amounts of lead were added.—L. H. Lampitt and H. S. Rooke, *The Analyst*, 58:733 (Dec.), 1933.

The Comparative Vitamin A Content of Nut-Margarines and Butter—Butter is known to be a rich source of vitamin A but from the reports of most investigators nut-margarines rate low in this vitamin, although nut-margarines containing palm oil have been shown to promote growth in white rats, the palm oil content ranging from 10 to 15 per cent. This investigation concerns a number of uncolored nut-margarines purchased on the open market. After an 8-week feeding period for depleting the body-store of vitamin A in the animals, different samples of nut-margarines were supplied. Animals receiving higher levels of nut-margarines gained some weight during the first 2 or 3 weeks but did not retain it. The highest test at 1 gm. per day was not sufficient to maintain growth during the experimental period of 8 weeks. Better gains were shown on 1/20 as much butter as margarine.

Chemical analysis of nut-margarines showed the moisture variation from 4.34 to 16.69 per cent and the fat from 78.12 to 92.54 per cent. The authors conclude that these commercial nut-margarines are an extremely poor source

of vitamin A and the variation in the fat constituent of the different samples seems to indicate the desirability of establishing standards for this product.—Charles F. Poe and Hazel A. Fehlmann, *J. Dairy Sci.*, 16:559 (Nov.), 1933.

Metabolic Studies of Children with Dental Caries—A group of children ranging from 3 to 20 years of age, averaging about 10 years, was studied with respect to the influence in reference to the variations of diet on dental caries. Determinations of calcium and inorganic phosphorus in the serum show practically no variation in the total amount in 3 groups, totalling 102 observations, the first group with no cavities and no caries, the second group with caries but not active, and the third group with active caries. Concentration of the calcium and phosphorus in the saliva did not differ in these three groups.

A study of the average retention of calcium, phosphorus, and nitrogen showed a correlation of the dental condition. There seems to be a definite relationship between the retention of calcium and phosphorus and the freedom from tooth decay. Calcium and phosphorus retention was also shown to be greater in the case of 7 subjects when the caries were inactive than in the same subjects with active caries. These observations furnish no evidence that dietary deficiency of phosphorus is a definite factor in the incidence of dental caries.

Histological studies show the prevention of caries as dependent upon the deposit of secondary dentin in the tooth and this deposit is determined by the metabolic activity of the individual. The individual utilization of the diets influences the resistance to decay which depends primarily on factors within the tooth. These data indicate that the optimum retentions of calcium and phosphorus are probably higher than those usually accepted as adequate.—Julian D. Boyd, Charles L. Drain and Genevieve Stearns, *J. Biol. Chem.*, 103:327 (Dec.), 1933.

The Bleaching and Improving of Flour—Reference is made to the report and recommendations of the Departmental Committee of the Ministry of Health of England, published in 1927, and their conclusions to the effect that while not recommending elimination of bleaching agents and improvers, the use of these should be limited in amount. The facts remain that today these substances are more extensively used than ever and it is contended that it would be difficult to ascribe harmfulness in their use.

Different methods of bleaching are described. The essential of bleaching is the reduction of the yellow tint. The question is asked if there is an appreciable amount of vitamin A content contributed by this germ whether or not bleaching should be allowed. The point is raised further that stored flour might be regarded as of lower nutritional value so far as the vitamin A is concerned.

With respect to chemical improvers, to which much objection is registered, the parallelism is drawn between the use of chemical improvers in the food itself and the accepted use of mineral improvers added to the soil in which plant food grows. If the bleaching of flour or improving with chemicals is injurious to health it should be stopped, but no real scientific proof of this is alleged to have so far been produced. Among countries which forbid chemical treatment are France, Belgium, Italy, Greece, South Africa.

If America were to prohibit the addition of chemicals to flour it is held that England probably would follow such practice but it is debated whether this would improve the quality of bread in England and America which is held to be of a higher

standard than that in France where a treatment is forbidden.

In answer to the question whether chemical treatments alter the flavor of bread, the conclusion is reached that bleaching and improving processes did not influence bread flavor one way or the other. It is finally concluded that chemicals are not necessarily harmful in foods since sodium chloride is a well known chemical commonly used and it is recommended that the solution of the problem for the present is to consider every form of treatment or bleaching on its individual merits rather than to promulgate a general approval or disapprobation.—D. W. Kent-Jones, *J. Soc. Chem. Indust.* (*Chem. & Ind.*), 52:409 (Nov. 24), 1933.

Bacterial Studies of Defrosted Peas, Spinach, and Lima Beans—Many fruits and vegetables are now preserved by the quick-freezing process. The problem of how frozen vegetables will keep in the home is an important one. Frozen foods may present a distinct public health problem, since knowledge of the bacterial and enzymatic changes that take place during freezing, storage and thawing is still far from complete. The work here reported was undertaken in the hope of contributing something to the knowledge of the bacterial content of defrosted specimens of a few commonly frozen vegetables.

Samples were obtained of fresh peas, spinach and lima beans. One portion of each was frozen by exposure to dry ice while another portion was held in the fresh state. Samples of commercially frozen products were all obtained. Samples of each were then set aside to be held for different lengths of time, one portion of each at 22° C. and one at 6° C. The length of such periods varied from approximately 12 to 72 hours. At the end of the period a quantitative bacterial count was made.

An attempt was made to correlate the types of organisms found in the defrosted samples with the types found in the fresh vegetables. Well isolated colonies were picked from the plates and transferred to agar slants. After incubating for 24 hours at 37° C., preparations from these cultures were stained by the Gram method and were examined for purity and morphology. Transfers were made into various culture media including litmus milk, gelatin, nitrate and tryptophane broth and into fermentation tubes containing dextrose, lactose and sucrose broths.

Fresh spinach, peas and lima beans when stored at 22° C. and 6° C. spoiled after 2 to 4 days, depending upon the initial condition of the product. Similar samples frozen in the laboratory and then defrosted spoiled after 12 to 24 hours at 22° C. and after 36 to 48 hours at 6° C. Commercially frozen samples of the same kinds of vegetables spoiled after 12 hours at 22° C. and after 24 to 36 hours at 6° C. Of the vegetables frozen in the laboratory the spinach spoiled most rapidly. Of the commercially frozen products, the spinach and lima beans spoiled more rapidly than the peas. Whether the more rapid spoilage of the commercially frozen products was due to the use of poor quality vegetables for freezing, to contamination during the process, or to an increase in the numbers of bacteria during storage is not known. The organisms isolated from the fresh vegetables included many micrococci, some bacilli, and a few achromobacter and sarcinae. The organisms isolated from the vegetables frozen in the laboratory included many bacilli, and a few achromobacter and micrococci. From the commercially frozen products were isolated many bacilli, some micrococci, a few achromobacter, and one diplococcus.—Elizabeth B. Brown, *J. Home Econ.*, 25:887 (Dec.), 1933.

CHILD HYGIENE

INFANT MORTALITY

Summary

MORTALITY, MORBIDITY, FATALITY

1. Since the first measures of social hygiene in favor of mother and child were enforced in Germany in 1905 infantile mortality has fallen from 20.5 per cent of living births to 7.9 per cent in 1932.

2. In the past digestive troubles took first place among the causes of death. In the summer months especially, a great number of babies fell victims to summer diarrhea, so that the mortality curve reached a peak known as the *estival point*. In the course of recent years this has given place to the *hibernal point*.

Among the causes of high winter mortality the most important without doubt is the group of acute diseases (influenza) of the air passages, especially *inflammation of the lungs* (bronchopneumonia). A small part only of these pneumonia cases follows upon infantile epidemic diseases, in particular on measles.

Forty per cent of deaths caused by pneumonia in the first year of age take place in the first 3 months of the year (January to March).

MORTALITY IN PRUSSIA (PER 1,000 LIVING BIRTHS)

Year	*Pneumonia*	*Digestive Troubles*
1913	10.2	37.6
1930	11.0	10.2

Mortality following on diseases of the alimentary tract has thus very considerably diminished, while that due to pneumonia has to some small extent increased.

While the percentage of deaths due to digestive troubles fell from 25 per cent in 1913 to 12 per cent in 1930—a 50 per cent reduction—that due to pneumonia rose from 6.8 per cent in 1913 to 13 per cent in 1930—a 50 per cent increase. The mortality of *preschool* age children has also much diminished, but the proportion of deaths *due to pneumonia* has also risen. Indeed this disease touches children particularly during their second and third years, when it is responsible for 28.3 per cent and 17.3 per cent of deaths.

3. Mortality statistics show the important place taken by diseases of the air passages during the first years of life. While we have learned how to fight by preventive measures the high death rate due to disease of the alimentary tract and to reduce it by two-thirds, we do not yet possess similar measures of preventing influenzal diseases. The danger caused by these affections to children in the early years of their life has rather increased than diminished. This has been noted in bad weather years such as 1918 or 1928–1929 (influenza years).

As in the fight against maladies of the alimentary tract the measures to be taken must depend on the clinical and socio-hygienic examination of the conditions that favor the outbreak and the development of the disease.

4. With regard to children we, in Germany, do not possess precise data concerning the *morbidity* of influenza infections nor concerning the *fatality* of pneumonia.

As a result of an inquiry set on foot by the League of Nations in 4 districts of Germany—2 *rural* districts and 2

urban (important centers)—we have established morbidity statistics from which we draw the following conclusions:

(*a*) Digestive troubles are much more frequent in towns than in the country.

(*b*) Influenzal diseases are scarcely more frequent in the big towns than in the country.

(*c*) *Prematurely* born or illegitimate children are not particularly menaced by influenzal diseases.

(*d*) The frequency of influenzal diseases is higher among rickety children.

(*e*) The frequency of influenzal diseases rises steadily until the second half of the first year of life has been reached.

Fatality statistics have been prepared on many occasions in Baby Homes and Children's Hospitals. Thus in the "Reichsanstalt zur Bekämpfung der Säuglings- und Kleinkindersterblichkeit," during the period from April 1, 1920, to March 31, 1929, the fatality rate from pneumonia among babies was 42 per cent, and from air passages diseases in general 22 per cent. We note therefore an extremely high death risk among babies suffering from pneumonia. (This is to be explained in great part by the fact that many children are only brought to hospital when in an advanced stage of the disease. Other statistics prepared by the City of Berlin Orphanage show distinctly the relation between immunity and death risk. Thus, while in 1921 and 1922—years when resistance was lowered by epidemics of measles and whooping cough—the death rate rose to 79 per cent. It reached 66 per cent, only, in 1924 and 1925 when general health conditions were better.

CONSTITUTIONAL AND CONDITIONAL FACTORS

5. The beginnings of inflammatory diseases of the upper air passages and of the lungs manifest themselves in two ways: the disease may have a primary character, that is to say, it may appear as an independent influenzal disease; or it may have a secondary character—it may be a consequence of digestive trouble.

The evolution of an inflammation of the air passages depends, firstly, on constitutional factors, and secondly, on conditional factors.

Among the constitutional factors must be mentioned in the first place the condition of immunity; the less the natural resistance, the graver is the evolution of the disease and the more easily is pneumonia produced. Limited immunity is also a characteristic of an exudative diathesis and of certain cases of neuropathy (vegetative stigmatization).

Among the conditional factors, age, method of feeding, general nutrition, absence or presence of rickets play their part.

Among babies the appearance of pneumonia and its evolution seem to be greatly influenced by social factors. But from the second year of life the appearance of the disease and its evolution seem to be more related to other acute infectious diseases. The influence of social factors on pneumonia in the baby is made clear by the high mortality among illegitimate children who are stricken by this disease; even in the first week of life, their mortality figures are already significant. These figures rise, and continue to rise considerably after the third week, until in the second month of life they reach the triple of those of legitimate children.

6. Statistical research with regard to the moment of the appearance of primary lung diseases caused by an infection, and to the moment of the appearance of maladies following on digestive troubles—secondary diseases—shows that the latter manifest themselves almost exclusively in the first 3 months of life. Thenceforward they become rarer and rarer, disappearing completely in the second half year. Their number, concurrent with the diminu-

tion of digestive troubles, falls to one-third. Primary pneumonias almost never occur during the first 3 months, and become frequent only toward the middle of the first year of life.

ACUTE INFLAMMATION OF THE AIR PASSAGES IN INSTITUTIONS

7. The dangers occurring through contagious diseases, particularly influenza, in whole-time or half-time welfare institutions are well known. According to Pfaundler, the risk of contagion is about 5 times greater for children in creches, day nurseries, and institutions of all kinds than for children living at home. Babies cared for during a long period in an institution contract influenzal diseases about 4 or 5 times during the year. Among hospital babies pneumonia makes its greatest number of victims from December to April, and its smallest from May to October.

The total of hospital pneumonia cases and deaths depends also on other factors; should there be an epidemic of influenza, measles, or whooping cough, or should food be indifferent in quantity or quality, pneumonia figures go up.

PROPHYLAXIS

8. In the present state of our knowledge our chances of preventing influenzal infections, particularly pneumonia, are few. Attempts are being made to prevent pneumonia by *specific prophylaxis* by means of vaccines and serums. The results are as yet not very satisfactory, but it is still possible to make progress in this direction.

For the moment one must try to prevent pneumonia by *general measures*, tending to increased immunity:

(*a*) By a quantitatively and qualitatively sufficient diet—(for the baby, fo course, breast feeding).

(*b*) By hardening the organism by means of light and air—by artificial sunlight in winter in the countries poor in sunshine.

(*c*) By the rickets prophylaxis.

(*d*) By a modern organization of Baby Institutions (Hospitals, Baby Homes, etc.)—sufficient rooms containing only a limited number of beds, facilities for the isolation of the sick and of suspected cases, galleries for air cure, sufficient staff, and a carefully prepared and appropriate diet.—

Professor Dr. F. Rott, Berlin—*Die sozialhygienische Bedeutung der grippalen Erkrankungen im Säuglingsalter, Association Internationale de Pédiatrie Préventive (Section Médicale de l'Union Internationale de Secours aux Enfants)*, Troisième Conférence, Luxembourg, les 27 et 28 septembre 1933.

PUBLIC HEALTH NURSING*

Write Miss Davis About This—To meet the demand of laymen who feel a new responsibility because of the economic situation for upholding public health nursing service the N.O.P.H.N. has prepared a series of five study programs for board and committee members.

The first course is a general introductory study of public health nursing in the locality of the group taking the course.

Another course covers the field of public health nursing publicity with full attention given to such media as newspapers, radio, printed material, talks, etc.

An analysis of a volunteer group is also offered. The organization of an active, interested, participating group of volunteers is studied, and methods suggested for utilizing a group of this kind in extending the service of the organization.

The fourth course is an analysis of case material and is devoted to a study of how this material may be applied in illustrating an organization's program. This course is in two series, one for city organizations and one for rural organizations.

The study of the relationship of the board to the professional staff is covered in the fifth course and is devoted to a *Personnel Manual*, recently published by the National Y.W.C.A.

Evelyn K. Davis, Assistant Director of the National Organization for Public Health Nursing, is in charge of the study program.—N.O.P.H.N. *Pub. Health Nurs. News*, 4 (Dec.), 1933.

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

Preventing Diphtheria and Scarlet Fever in Nurses—Durand Hospital in Chicago, with a capacity of 60 beds, receives only patients who are ill with infectious diseases (mostly diphtheria and scarlet fever). Nursing is done by student nurse affiliates from other nursing schools in Chicago under trained supervisors.

Every effort is made to protect the health of these nurses. Nose and throat cultures are made regularly each week; a high degree of cleanliness of patients and surroundings is maintained; their technic and procedures are rigidly supervised.

Careful records have been kept of the incidence of scarlet fever and diphtheria in the nurses while on duty. All are given the Schick test and the positives are immunized to a negative Schick before entering on duty. Not a case of diphtheria has developed among the nurses since December, 1927.

The Dick test is also given all nurses and a preventive injection of toxin is given all susceptibles. Not a single case of scarlet fever has developed among them since December, 1927, either.

The writers repeat the statement given in a former report: "By means of Schick and Dick tests followed, when necessary, with active immunization, nurses can be selected who are practically free from the danger of diphtheria and scarlet fever."—Ludwig Heketoen, M.D. and Charlotte Johnson, R.N., *J.A.M.A.* 102, 1:41 (Jan. 6), 1934.

More About C. W. A. Nursing—A Child Health Recovery program has been launched in California with 50 C.W.A. nurses, formerly unemployed,

at work, locating undernourished children. Later plans will be made to try to overcome the malnutrition, where it exists, and prevent further progress through dietary measures and, where necessary, corrective medical procedures. There will be a general supervisor of the nursing program with 5 district supervisors to work more closely with the staff nurses.—*Weekly Bull.*, California State Dept. of Public Health XII, 51:20 (Jan.), 1934.

The Illinois State Nurses' Association through its Placement Service has approved and assigned 600 C.W.S. nurses for service in public health in Illinois.—*Health Broadcaster* V, IX (Jan.), 1934.

Two Members of Our Section Make Changes—Katherine Faville, who has been head of the Department of Nursing, College of Liberal Arts, Colleges of the City of Detroit, on February 1 became associated with Marion G. Howell, Director of the Course in Public Health Nursing in the School of Applied Social Sciences, in Western Reserve University, Cleveland, Ohio.

Ruth E. Mettinger of Sanford, Fla., left her duties as Red Cross Nursing Field Representative for North and South Carolina, Louisiana, Mississippi, Alabama, Georgia, and Florida, January 29 to head up the Bureau of Public Health Nursing in the Florida State Board of Health.

On to Washington!—Many nurses and lay members of public health nursing boards are making plans to attend the Biennial Nurses' Convention in Washington, D. C., April 23 to 27, inclusive. National Organization for Public Health Nursing headquarters will be at the Hotel Washington.

N.O.P.H.N. general session topics will be: New Developments in Public Health and Social Work; Public Health Nursing To-day; Maternal and Child Health, Communicable Disease, Nutrition, and Mental Health; The Changing Order and Community Planning.

There will be round tables according to population groupings and for school and industrial nurses. One session is left free for discussion of whatever public health nursing problems are most pressing in April.

There will be luncheons galore for: I.V.S. Advisory Council; Board and Committee Members; field nurses; Chairmen of Public Health Nursing Sections of S.N.A.'s. No nurse needs to be left out in the cold. She will belong somewhere every minute of the time.

The American Nurses' Association and National League of Nursing Education programs will be in an early issue of the *American Journal of Nursing*. The programs of the joint sessions will appear in the February, 1934, *Public Health Nursing*.

The American Nurses Association with over 120,000 members is the largest professional organization for women in the world and its convention in conjunction with that of the N.L.N.E. and the N.O.P.H.N. means a great deal to American nurses.—N.O.P.H.N. *Listening in*, III, 1 (Jan.), 1934.

EDUCATION AND PUBLICITY*

It Was "Almost 100 Per Cent News"—From time to time this department has urged the publicity value of studies in public health, even beyond the cities where they are made. Some are more widely usable than others, but the *News-Letter* of the Commonwealth Fund, New York City, reports on one of the extra successful reports:

Late in November, the Fund published *Maternal Mortality in New York City*, the report of a study made by the New York Academy of Medicine. This was greeted by the most extensive publicity ever accorded to any Fund publication. A summary prepared and issued by the Academy of Medicine led 310 newspapers in 39 states to devote 2,355 column inches to the report, and the clippings are still coming in. In New York City both the *Times* and *Herald-Tribune* printed the summary practically in full, starting on the front page. The *Times* and the *World Telegram*, and several papers outside of New York, discussed it editorially, and several weekly magazines, including the *Literary Digest*, *Colliers*, and *Time*, dwelt on the importance of the study. The *Journal of the American Medical Association* published the summary in full.

So extensive was the newspaper attention to the report that an article in *Editor and Publisher* made it the subject of discussion, analyzing, "as a test of intelligent news handling," the use made of "this almost 100 per cent news item."

Dr. Hooker, director of the study, knows of no less than 15 communities, including Buffalo, Philadelphia, Pittsburgh, Boston, Cincinnati, Atlanta, New Orleans, St. Louis, and Oakland, California, which have undertaken or are now beginning studies patterned after and stimulated by this project.

Looking Backwards to "How Difficult Is Truth"—Last month we quoted a statement about the certainty of recovery from diphtheria when a case received "sufficient serum on the first day of illness," following this with a quotation from another source questioning the first statement.

The follow-up comes in a letter:

Although at first I felt you were a little rough on us, I do not now feel so after hearing from Dr. Park and, just by accident, from Dr. ————.

I doubt if anything in medicine is quite one hundred per cent. Probably Ivory soap has the percentage more clearly worked out.

I do not believe you intend the apparent inference that the statement was just an overnight haphazard somewhat random one not based on adequate consideration and study. As a matter of fact, back of it goes more than ten years of personal investigation of diphtheria deaths from the point of view of date of onset and the date of first antitoxin.

The writer of the above letter received the following from an authoritative source:

Of course I have serious objections to saying that anything invariably results from any given set of known causes. I dare say the day will come when the sun will not rise, if you can call that a day.

I do not know that Mr. Routzhan's statement is any more true than yours. I do not believe that anyone has figures based upon unequivocal data which would enable them to say what the percentage of deaths is. Obviously if one wanted to quibble he could say that no dose which failed to cure was sufficient.

Health education offers many such perplexing situations.

The Twentieth National Negro Health Week—As has become customary, the U. S. Public Health Service is sending out samples of materials for use in organizing local observances April 1–8, 1934. The official announcement says:

National Negro Health Week was initiated in 1915 by the late Booker T. Washington.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

It was not a birth, but rather an adoption. The Negro Organization Society of Virginia, with headquarters at Hampton Institute where then resided Maj. R. R. Moton, commandant, friend of Booker T. Washington, is the real father of Health Week. Dr. Washington sensed the capacity of this movement and appreciated its possibilities, and thus became the All-American champion of Negro health.

The announcement briefly reviews the development up to 1934 when 45 national or regional organizations, white or colored, unite in the call.

The program for the Week includes: Sunday, Mobilization Day; Monday, Home Health Day; Tuesday, Community Sanitation Day; Wednesday, Special Campaign Day; Thursday, Adults' Health Day; Friday, School Health Day; Saturday, General Clean-Up Day; Sunday, Report and Follow-Up Day.

Limited quantities of material will be supplied without cost, samples being sent to health agencies upon request. A dramatization of "The Daily Half Dozen" will be sent upon request. Address: National Negro Health Week, U. S. Public Health Service, Washington, D. C.

Quantity orders should be sent to Superintendent of Documents, Washington, D. C., for the following: poster, 100 for *$1.80;* bulletin (with plans), 100 for *$1.40;* leaflets for schools, 100 for *30 cents.*

A Newspaper Desk Book—Most newspapers develop style or rules in capitalization, punctuation, and so on. In many cases this style is printed on a sheet or a pamphlet. In other cases it may be but a typewritten sheet posted in the city room. Other newspapers merely pass on the style from editor to reporters.

The *Iowa Newspaper Desk Book* is a compilation of the School of Journalism, suggested for use by Iowa newspapers, which says:

A newspaper usually develops a set of individual usages due to office necessities or the opinions, habits and whims of executives. Such development of the individuality of a paper is to be encouraged so long as it does not lead to unjustifiable and freakish eccentricity. . . .

There are many controverted matters in modern punctuation, capitalization and diction. This style book has had to record arbitrary decisions on all disputed points. Some of these decisions have been arrived at only after laborious study of authorities—especially that authority represented by the concensus of usage of the better newspapers. . . .

Newspaper capitalization and punctuation is sharply divided from that of books. The "down style" of typography has won its way with the newspapers, and the end is not yet. The psychologists have shown us that lower-case letters read much more easily than capitals, and linotype operators have developed great increases in speed from the limitation of "caps." Likewise, it has been found that much of the nicely logical but "fussy" punctuation developed by the more pedantic is not necessary to clearness, and as a result the modern newspaper gets along very well with about half the volume of points used in book composition.

Among the chapters are those on reporting (of special value to those who write on health topics for newspaper use), capitalization, punctuation, abbreviation, figures, titles, spelling and division of words.

The health workers may well use this as a guide in writing copy, making note of standardized variations observed in the local newspapers. Issued by University of Iowa, Iowa City, Ia. 1933. 54 pages. *10 cents.*

Public Health Education Section at Pasadena—The Section Council met as a program committee in New York, Feb. 3, with Chairman Shepard of San Francisco, and Secretary Connolly of Detroit among those present. An attractive and useful program was planned. It was decided to conduct a Health Education Institute which should be devoted to school health education.

"Carrying the Message to the People"—This is the happy title of a chapter in *A City Set on a Hill*, by C.-E. A. Winslow. In that review of the significance of the Syracuse Health Demonstration the twelfth chapter takes up the necessity for the health services having behind them "an aroused and intelligent body of public opinion" for "the people as a whole must comprehend the needs for such services and the value of such services" if those services are to be supported and if they are to be well utilized by the people.

Here Prof. Winslow outlines concisely the relationship of health education to the health program as a whole, plus three essential characteristics of satisfactory health education:

> . . . it is now recognized that an organized program of popular health instruction must form a vital element in the general scheme of community health promotion. Such a program should be planned to bring to the people of the community the increasing knowledge of the principles of medical and sanitary science which they need to apply in their daily living, as individuals and as a group, for the attainment of maximum health and efficiency. It should utilize all the resources now available for disseminating information: the press, the platform, the radio, the cinema, the exhibit, the printed pamphlet, and the like. In so doing, it must keep three conditions always in view. It must bring to the people only what is established on a sound scientific basis. It must present its facts with the most effective technic, as to selection of content and form, so as to make the essential facts clear and to arouse an effective desire to apply them. And, finally, the program must be so planned as to emphasize those things which are vitally important and to do so at the times and under the conditions where application of the principles in question can most easily and effectively be made.

In the light of the above the most significant statement in the chapter is the following, which we put into italics that none may overlook it:

To attain such objectives as these clearly requires definite and specific leadership by persons with special training in the technic of presentation. If the modern health program is to bear its fullest fruit, the Health Department must have a special division of popular health instruction under the direction of a trained specialist in this field.

We count upon this chapter as a whole being widely read by public health workers who will so generally wish to study the Syracuse experiment through the eyes of Prof. Winslow. Briefly, the chapter takes up the need for organized health instruction; development of popular health instruction in Syracuse; the Bureau of Health Education of the Health Department; the Onondaga Health Association; community planning; appraisal and costs of popular health instruction.

There are frequent references to a "program of health education" but there is little light on what that program was, on what it was based, or how it was arrived at. Is it not natural for the reader to make the obvious deduction that the program is made up largely of the materials and activities which occupy much of the chapter?

A program or a plan for health education, as we see it, is not the planning of the details of a particular project or event. Rather we are thinking of a plan or program for a year or other extended period. It is the selection of the objectives and the chief audiences and mediums mapped out in relation to the needs of the community and the resources of the health agency, or the group of health agencies.

Unhappily, the appraisal form does not call for a program or plan, and none of the health survey reports, as we have seen them, record the lack of a program, or propose one for the future. Hence the disappointment that in *A City Set on a Hill* there is not described a broad, solid base of program planning for the admirable health education activities presented in this chapter.

A City Set on a Hill is published by

Doubleday, Doran and Co., Garden City, N. Y. 382 pages. $3. Order from A.P.H.A. Book Service.

"Health Exhibitions" — by J. Mackintosh (*Mother and Child*, 5 Tavistock Square, London, W. C. 1. July, 1933. *9d.* a copy), mentions that

> In the history of public health during the present century, the contribution of the health exhibit has been of incalculable value. Long before the War small exhibits had been shown from time to time in connection with courses of lectures on hygiene.

Mr. Mackintosh traces the holding of the successive large-scale exhibitions in connection with National Baby Week, and the development of the exhibition idea by the National Council of Maternity and Child Welfare.

The Council maintains a permanent exhibition at Carnegie House, 117, Piccadilly, London, W. 1., illustrated in connection with the article, to be noted on the itineraries of health workers from other countries. The Council is a continuous source from which many traveling exhibits are sent throughout the year.

Local Clinics on Amateur Movies—Health councils have received from Social Work Publicity Council a suggested plan for demonstration and clinic sessions on the use of amateur motion pictures. A copy of the plan will be sent to any one interested in the use of home-made pictures by health and welfare groups.

The Council has issued a "List of Amateur Motion Pictures" which may be drawn upon in planning a local demonstration. Send *6 cents* to Social Work Publicity Council, 130 East 22d St., New York, N. Y.

From these memoranda we quote the following on "What Is An Amateur Movie":

> The term is elastic for the purposes of this memorandum. It covers any picture not wholly or primarily a professional production.
>
> The photography may be done by a staff member—by a board or committee member—by an amateur movie volunteer—even by a professional photographer (as has been done in a few cases).
>
> Common to all amateur pictures is the 16 mm. non-inflammable film, usable in projectors without a booth.
>
> The amateur picture is not bound by conventions of theatrical production, nor hampered by visions of the theatrical audience. As a rule it is intended for a more intimate presentation, although modern 16 mm. projectors permit successful screenings up to 500 in the audience. Drama or plot is not essential, but effective continuity is an important element in the successful picture. (Valuable assistance in planning the continuity may be secured from Amateur Cinema League, 105 West 40th St., New York, N. Y.) Advance planning before production is of paramount importance in achieving effectiveness in an amateur picture. The available equipment makes poor photography inexcusable.

Getting Books Read—Probably we have done too little in promoting the use of our public health journals. Equally important, and probably more difficult to carry through, is the wider use of supplementary sources for health workers, physicians, and other groups.

The National Tuberculosis Association

> . . . is experimenting with the use of a package library for physicians. The library is designed especially for use at medical meetings, selected clinics where physicians have time to look over books, at medical libraries and so forth. Arrangements may be made with the National Tuberculosis Association for the loan of the library. There is no charge for the books but the borrower must pay the transportation charges both ways. The package weighs approximately 20 pounds.

The Brooklyn Tuberculosis and Health Association, 293 Schermerhorn St., has assembled a "Minimum Tuberculosis Library for Physicians" which is thus described:

> This abbreviated shelf of books covering all phases of Tuberculosis represents what may be called a minimum library that every physician, whether in general or specialized practice, should either own or to which he should have easy access.

Health Education in Indiana—

Health education work in Indiana is now being carried on under the supervision of the Indiana University School of Medicine and the state and local medical associations. In this set-up the Bureau of Health Education in the Division of Public Health acts as a contact medium between the lay public and the medical profession, helps plan health programs and campaigns, secures speakers, provides health films, literature, exhibits, etc. This service and material is furnished without cost.

To receive the coöperation of the Bureau, any group wishing to put on a health program must first secure the approval of the local medical society through its secretary. This approval is absolutely necessary.

The next step is to inform the director of the Bureau, giving him ample time, as to the date, hour and place of the proposed meeting and the subject of the talk, films, or exhibit desired. The Bureau will then make the necessary arrangements. If the local medical society prefers, a speaker from outside the community may be secured, but as a rule local physicians are ready and willing to fill these engagements.—

Echoes, State Bureau of Public Health Nursing, Indianapolis.

A Compliment from North Carolina—A marked copy of *Health Bulletin*, North Carolina State Board of Health, comes to us carrying a two-thirds of a page quotation from this department of the *Journal*.

DEPRESSION

The references under this heading may supply background material for writers or speakers. Some of the references may be useful to officials or to relief and family welfare agencies—if passed on to them.

"Economic Aspects of Present-Day Health Problems," by W. W. McFarland, M.D., *Pennsylvania's Health*, State Dept. of Health, Harrisburg, Pa. *Nov.-Dec.*, 1933. Taxpayer's viewpoint plus necessity of maintaining standards.

"Sickness Among the 'Depression Poor,'" by Perrott and Collins. *American Journal of Public Health*. Feb., 1934.

"Sickness and the Depression," by Perrott and Collins; and "Diets of Low-Income Families in Cleveland, Detroit and Syracuse," by Wiehl. *Quarterly*, Milbank Memorial Fund, 40 Wall St., New York, N. Y., Jan., 1934. *25 cents*. The first is a "preliminary report upon a survey of wage-earning families in Baltimore, Cleveland, and Syracuse.

"Youth Never Comes Again," by Clinch Calkins, is for those who are concerned about the excessive free time of present-day young people, and those who want to do something about it. There is the definite suggestion that "health and hygiene groups (public and private)" are among those interested in a program of adult education. 71 pages. *25 cents*. Committee on Unemployed Youth, 450 7th Ave., New York, N. Y.

"Idleness and the Health of a Neighborhood" is one of those rare studies for which a previous study made in 1922 provided "a background of fairly normal conditions against which the disruption of health and economic life during the depression years stands out sharply." This study was made by G. H. Berry, and published by New York Association for Improving the Conditions of the Poor, 105 East 22d St., New York, N. Y. 102 pages. Diagrams and tables. *$1.00*.

"The Importance of Milk in Relief Diets" is a 3-page review of recent discussion, with a half dozen reading references. National Dairy Council, Chicago. *Free*.

BULLETINS

"The Handicapped" is the general theme of the Oct.-Dec., 1933, issue of *Commonhealth*, Massachusetts Dept. of Public Health, Boston. 111 pages, to which is added a 6-page index for the 4 issues of the year.

Health News, New York State Dept. of Health, Albany, N. Y., appears in

a brand new dress. Get a copy and see it for yourself.

A special milk number of *Canadian Public Health Journal,* published by Canadian Public Health Assn., devoted 52 pages to a variety of topics from the farm and the home, and the problems and procedures along the way to safe and wise use of milk. Jan., 1934. 105 Bond St., Toronto, Ontario. Reprints, *35 cents.*

EDUCATION AND REFERENCE

Here are listed publications for background in writing and speaking, for intensive use with especially selected individuals, or for more general use in the community.

Another booklet issued by Cancer Control Committee of Dept. of Health, New Haven, Conn., carries on its front cover the rugged heights of cancer mortality expressed in a solid diagram, this time in purple. The illustration "bleeds" over the left, right, and lower edges of the page. "Cancer," appears as a title set in the upper white space section.

"Asphyxial Death" is a one-page copy of an editorial comment in the *Journal* of the American Medical Assn., reproduced on a cover-page of the *Journal.* Illustrates use of the off-set process when one wishes to tie-up the authoritative journal with a clipping. Society for the Prevention of Asphyxial Death, 2 East 103d St., New York, N. Y. Send *3 cents* postage.

"Cancer—A Challenge," by Shields Warren. A. M. A., 535 North Dearborn St., Chicago. 9 pages. *10 cents.*

"For Good Health," a poster, mostly a well lettered placard. A simple food selection guide. Metropolitan Life Insurance Co., New York and Ottawa. *Free.*

"How to Gain Weight: It Is Important for Some to Know," by Laura A. Miller. A. M. A., 535 Dearborn St., Chicago, Ill. *9 pages. 5 cents.*

"Maternal Deaths," by Children's Bureau, Washington, D. C. "Brief report of a study made in 15 states." Superintendent of Documents, Washington, D. C. *5 cents.*

"The Partial Conquest of Heart Disease," by D. B. Armstrong, M.D. Metropolitan Life Insurance Co., New York, N. Y. *Free.* Reprint from *American Medicine.*

"The Practice of Preventive Medicine by the Private Practitioner," by Iago Galdston, M.D., New York Academy of Medicine, 2 East 103d St., New York, N. Y. 15 pages. *10 cents.* Reprint from *Health Examiner.* Includes an interpretation of the periodic health examination.

"Tuberculosis—A Family Disease: Social Aspects," by Edward Hochhauser, Committee for Care of Jewish Tuberculous, 71 West 47th St., New York, N. Y. Reprint from *Transactions of National Tuberculosis Assn.,* 1933. "An increasing percentage of our tuberculous patients discharged from hospitals and sanatoria can be rehabilitated through greater interest in the family method of treating the patient." Send *3 cents* postage to the author.

"What Builds Babies?" Revised, 1933. Children's Bureau, Washington, D. C. Single copies *free.* 8 pages. "The mother's diet in the pregnant and nursing periods."

HONORABLE MENTION

To Department of Public Health, Union of South Africa: for full table of contents in annual report.

To State Board of Health of Maryland: for Annual Report with *both table of contents and index.* Quite detailed index taking 19 pages of the 235-page report; with references to health education in Letter of Transmittal, and reports of Bureau of Vital Statistics, Bureau of Child Hygiene, and Division of Oral Hygiene.

TO DO OR TO USE

"Friendly Messengers Carrying Lessons of Health," by Mary P. Connolly. How the Detroit Health Dept. and Detroit Chapter of the Red Cross reach the local Negro population. *Red Cross Courier,* Washington, D. C. Dec., 1933. *20 cents.*

"Health Recovery Campaign," in "Public Health Administration" section, *American Journal of Public Health.* Feb., 1934. With illustrations of materials for use in the 1934 Early Diagnosis Campaign.

In "Health Examinations," by M. A. Lundwall (*Womans Press,* 600 Lexington Ave., New York, N. Y. Feb., 1934. *20 cents*), is a reminder of educational use to be made of record data:

> When a comparative study is made of the 3 years' examinations some interesting conclusions may be announced, such as the effect of economic stress on general health; the influence health teaching has had in the change of health habits. At present, the health and physical education program must be worked closely together if the individual is to attain that joy of living which comes from practising health habits intelligently.

Snapshots at night are now possible with a new supersensitive film, taken with the aid of two or three of the photoflood bulbs. The film has three times the speed of ordinary film under ordinary light.

MOTION PICTURES

For advance information about dates for "Damaged Lives" at your local motion picture house address: American Social Hygiene Assn., 450 7th Ave., New York, N. Y.

A new folder "Facts—Results" tells in striking fashion about the reception given to "Man Against Microbe," the motion picture of Metropolitan Life Insurance Co., New York and Ottawa. *Free.*

"This business of continuity" explains the significance of "continuity" in the production of motion pictures. "Clipper explodes" shows how to handle negative to produce continuity. "Weaving a magic carpet" discusses travel pictures, but much of it applies to pictures of health camps, classes and institutions. "The formula needs no magic—only careful planning." All in *Movie Makers,* 105 W. 40th St., New York, N. Y. Oct., 1933. *25 cents.*

RADIO

John McCormack, in an interview on broadcasting, in *New York Times,* Dec. 3, 1933, said:

> The English . . . seem to have discovered the knack of making abstruse subjects clear, interesting and entertaining. American broadcasters should concentrate on more speakers who devote their talents to presenting interesting topics in a popular style.

"The Drug and Beauty Racket." *Education by Radio,* National Committee on Education by Radio, 1201 16th St., N. W., Washington, D. C. Racketeering via Radio. *Free.*

Health by Radio is a 155-page, paper-bound book, reporting "the sixth hundred of a series of health talks broadcast every Friday night by the New York State Dept. of Health from Station WGY." From the introduction:

> Over 10 years have passed since the Division of Public Health Education of the State Department of Health, began broadcasting health information from Station WGY, Schenectady, through the courtesy of the General Electric Company.
>
> There is no way of estimating the amount of human suffering which has thus been prevented or alleviated. The advice and suggestions given by the authors of these talks must have resulted, however, in a far better general understanding of basic facts relating to health and disease.
>
> Individual copies of any of the broadcasts contained in this booklet can be obtained by writing to the Division of Public Health Education, State Department of Health, Albany, N. Y.

In June, 1933, *Hygeia* carried a devastating article on "The Radio Gymnasium Class," by Alfred C.

Board, self-confessed leader of radio classes. After a thorough deflation the author proceeded to reflate and stabilize the radio gymnasium class on the basis of certain definite specifications. The article makes good reading for those who like *American Mercury*. In Oct., 1933, *Hygeia* published an answer from Dr. Jesse Feiring Williams of Teachers College, an interpretation of modern physical education vs. the radio class.

SOCIAL HYGIENE

"Attitudes and Practices of Parents in Sex Education of Children," by M. S. Dillon. *Journal of Home Economics*, Baltimore, Md. Dec., 1933. *30 cents*. In this study ". . . the second outstanding finding, and probably the most important, was the amazing inconsistency shown by the parents between their opinions, so enthusiastically and sincerely expressed, and their practices."

"Fight Venereal Diseases with Knowledge." City Health Dept., Baltimore, Md. 8 pages; heavy paper; pictorial cover. The needed knowledge about the three venereal diseases.

"Social Hygiene Exhibit Screen." American Social Hygiene Assn., 450 7th Ave., New York, N. Y. *Free*. A small folder illustrating and describing a 3-wing display screen, with 19 samples of publications. Screen is sold, or loaned for transportation cost.

"The Wonderful Story of Life," New York State Dept. of Health, Albany, N. Y. 24 pages. Parents' talks to be read or told to young children.

From "Social Aspects of the Venereal Disease Problem in Canada," by F. S. Parney, M.D. *National Health Review*, Ottawa, Ont., we glean the following:

In the war against venereal disease others than the psychologist have parts to play. The physiologist must prepare for the guidance of parents and the laity in general, a plain, simple, but comprehensive statement of scientific facts regarding the physiology of sex, just as he has done in the past with regard to the physiology of digestion, assimilation and excretion of food materials.

The educationist, either through the department of health or voluntary health and mental hygiene organizations, must get this information over to the public in such a matter-of-fact way that it will become part and parcel of the individual's idea not only of personal hygiene but also of his normal social adjustment.

WANTED!

We have been asked for information about adult or popular health education programs.

Please send copies of office memoranda, reports, or other material to editor of this department.

Have you a program of adult or popular health education for your city, county or state?

Have you an article, a convention paper, or other material discussing such programs?

REPORTS

The "Annual Report" of American National Red Cross (Washington, D. C.) for year ending June 30, 1933, as usual includes a helpful device. At the head of many of the service chapters is an explanatory paragraph. For example: under "Public Health Nursing and Home Hygiene" appears the following:

The Public Health Nursing Service spreads knowledge of healthful living and coöperates with health authorities and the medical profession in checking the spread of disease. Home Hygiene and Care of the Sick gives practical instruction in infant and child care and in home care of the sick and develops correct attitudes toward health and disease.

From the Annual Report of Royal New Zealand Society for the Health of Women and Children:

The Society was started as a League for mutual helpfulness and mutual education, with a full recognition of the fact that, so far as motherhood and babyhood were concerned, there was as much need for practical reform and "going to school" on the part of the cultured and well-to-do as there was on the part of the so-called "poor and ignorant."

MAGAZINE ARTICLES

"I Read That in a Magazine" introduced the following:

This publicity slogan is the basis of our policy of reporting what current magazines are saying about social problems and social work. What your magazine reading public is being told builds up a degree of acceptance or resistance to your own publicity. Even though the articles may not bear directly on your own work, they help create a frame of mind in which social work information takes a more important place. Some of these articles may be overlooked by your public unless you call attention to them. There is another reason, or we might call it a hope, connected with our reviews—that now and then some of our members will write at least as much as a postal card of appreciation to the editors, when their articles interpret social work well.—

News Bulletin, Social Work Publicity Council, 130 East 22d St., New York.

So say we for this section of "Education and Publicity." Many of the articles here listed during the year contain quotable material for speakers and for other uses. The articles also suggest angles or slants of approaches for making old stuff fresh and interesting.

"A Diet Lesson from the Arctic," by K. Glover. *Herald-Tribune Magazine*, New York, N. Y. Jan. 28, 1934. Pre-packed daily balanced rations.

"A New Approach to Sex Education," by C. Pilpel. *Delineator*, New York, N. Y. Oct., 1933. *10 cents.* "Delineator has paved the way with fearless discussions on this subject."

"Why Die Before Your Time?" by H. S. Williams, M.D. *Collier's*. Jan. 13, 1934. "It's a silly thing to do . . . but most people are, or will be guilty."

SAFETY

"An Auto Sherlock Holmes," by F. M. Kreml. New York *Herald Tribune* Sunday Magazine. Dec. 31, 1933. How the Evanston police catch *and convict* traffic law violators.

"Blind Drivers with Good Eyes," by Dr. C. E. Pollard. *Kiwanis Magazine*, 520 N. Michigan Ave., Chicago, Ill. Dec., 1933. *15 cents.* Mental factors and eye habits which produce car accidents. Something to do something about.

"Industrial Hygiene and Safety," Metropolitan Life Insurance Co., New York, and Ottawa, Ontario, briefly defines "industrial hygiene" and "industrial safety," and then explains the publications and other services offered by the Metropolitan. 24 pages. *Free.*

SCHOOLS AND CHILDREN

The entire Oct. 15, 1933, issue of *Health Briefs* is devoted to the "Blue Ribbon Program" in the schools of Tennessee, promoted by the State Dept. of Public Health, Nashville.

Any child is eligible to receive a Blue Ribbon when evidence is shown that he (a) is making satisfactory progress in his studies; (b) is amenable to the ordinary requirements of school discipline; (c) is reasonably coöperative in the practice of health habits; (d) is free of remediable physical defects and meets certain immunity standards. Immunization standards include protection against typhoid fever, diphtheria and smallpox.

"Health Instruction in Grades IX–XII," by J. F. Rogers, Office of Education, Washington, D. C. Sold by Supt. of Documents, Washington, D. C. *5 cents.* From "Theory and practice" to "College credit." 22 pages.

"Teaching Health in School Cafeterias: Baltimore's Poster Program." *Trained Nurse and Hospital Review*, 468 4th Ave., New York, N. Y. Oct., 1933. *35 cents.* Illustrated description of visual material for stimulating wise food selection.

"Your Child and the School" is a series of 10 newspaper articles by Dr. Allen G. Ireland, director of physical and health education, N. J. State Dept. of Public Instruction. Mats supplied free by Health News Service, 22 East 40th St., New York, N. Y.

BOOKS AND REPORTS

Report to the United States Government on Tuberculosis with Some Therapeutic and Prophylactic Suggestions—*By S. Adolphus Knopf, M.D. Revised and Enlarged Report submitted to the State Department, War Department and War Veterans Bureau as Government Delegate to the International Union Against Tuberculosis Held at the Hague, Sept. 6–9, 1932. New York: The National Tuberculosis Assn.,* 1933. 59 pp. Price, $1.15.

Dr. Knopf's lifelong interest in tuberculosis, his command of languages, his wide training and familiarity with European as well as American conditions, make him singularly fitted for the task on which he here makes a report. Of particular interest is his observation of the use of sanocrysin, but in view of the contradictory evidence reported by Dr. Knopf, we still remain unconvinced. We commend his final paragraph in answer to Professor Bernard, who claimed recovery or notable improvement in some 50 per cent of the cases treated with sanocrysin, in which he points out that by hygienic and dietetic methods, clinical recovery or notable improvement in 50 per cent or more cases is obtained.

The second chapter is devoted to the after-care of tuberculous subjects. England has its notable tuberculosis villages, such as Preston Hall and Papworth. Germany has tried to found establishments, but up to the time of this report, there were no institutions for tuberculous war veterans. France has created a Sanitary City, which Dr. Knopf thinks will do much good. It is evident that the United States is doing better by its veterans than any other country, as there are now 14 hospitals for the care of tuberculous veterans, as well as other public facilities, in addition to which we have a number of private and state institutions.

The author gives a full description of his respiratory therapy or diaphragmatic respiration, which has attracted much attention. Preventive inoculation with BCG is considered favorably. The last chapters are largely given up to the prevention of tuberculosis in children by breathing exercises, outdoor life, etc.

The book is abundantly and beautifully illustrated, the frontispiece being a photograph of the Queen Mother of the Netherlands, who was Patroness of the Conference at the Hague. There are photographs of the institutions in England and elsewhere, and a full series showing respiratory exercises.

The report can be recommended as a record of the observations of an interesting trip emphasized by important conferences and visits to war veterans hospitals made by an enthusiastic and competent specialist in tuberculosis.

MAZŸCK P. RAVENEL

The Human Problems of an Industrial Civilization—*By Elton Mayo. New York: Macmillan,* 1933. 194 pp. Price, $2.00.

This volume proceeds at once and without introduction to its subject matter, comprising eight chapters: I. Fatigue, II. What is Monotony? III. The Hawthorne Experiment, IV. Development of the Western Electric Inquiry, V. The Meaning of "Morale," VI. The Reaction of Industry upon the Social Order, VII. Theories of Government and the Social Order, VIII. The

Problem of the Administrator—especially the new administrator.

Excerpting much literature as a *basis argumenti*, particularly in the earlier chapters (the author index lists several citations from most of its 65 sources), the author develops his own special field in the later chapters.

There is a tendency to lengthy quotations, repetition, and verbosity, and some may wish that a summary had been provided for each chapter, but the concluding chapter is of summarizing type. Fault may also be found in omitting references to other works of the same tenor such as Frankel and Fleischer's *Human Factor in Industry*, and the findings and efforts of the Life Extension Institute and its former medical director, Dr. Eugene L. Fisk, likewise the annual reports of the Committee on Fatigue of the Industrial Hygiene Section of the American Public Health Association. However, the literature cited is widely selected and authoritative.

The practical applications made at the Hawthorne Plant of the Western Electric Company make very instructive reading; after all, there is always the individuality, the psychology and the group response of the human being to be considered.

We think the author missed it in his implied prophecy (p. 184) wherein he discusses the abandonment of the gold standard in England with so little local (English) excitement, and asks whether such a step in the United States would have so little effect, or " cause no visible tremor in the social life of the country? " The remark was made just prior to our own abandonment of the gold standard (and whatever " tremor " this did cause).

The book represents the author's contributions to the Lowell Lectures given in 1933, and embodies some conceptions of the methods and findings of several groups of workers at Harvard University in their industrial investigations. The concluding dogma is, collaboration based upon the coherent unity of biochemical, medical, industrial, and anthropological factors in the perfection of our industrial civilization —certainly an ideal concept and masterfully handled in the present work. The book will interest all who have to do with employee problems.

EMERY R. HAYHURST

Red Medicine: Socialized Health in Soviet Russia—*By Sir Arthur Newsholme, K.C.B., M.D., and John Adams Kingsbury, LL.D. New York: Doubleday, Doran,* 1933. 324 pp. Price, $2.50.

The descriptive phrase, " Sketch of Medical and Public Health Administration in Soviet Russia," which is found in the Introduction, admirably characterizes this very readable book.

Sir Arthur Newsholme's earlier report for the Milbank Memorial Fund, *International Studies on the Relation Between the Private and Official Practice of Medicine, with Special Reference to the Prevention of Disease,* did not include a study of Russia. It was later decided that an investigation of Russian medico-social problems would be of benefit, and this book represents the result of an extensive, though brief, trip through Russia for such purposes. Adequate introductions, special conferences, with a background of reading and direct inquiry afforded the authors an unusual opportunity for obtaining accurate information.

Approximately the first half of the book is taken up with a diary-like outline of the trip which led from Moscow and Leningrad through Georgia, the Crimea, the North Caucasus, the Black Sea area, and the Ukraine, and general information regarding Russia's early government, the industrial and agricultural situation, and civil and home life. All this is included in order to give

the reader a proper appreciation of the latter half of the book which records a statistical and critical survey of medical conditions. This section includes chapters on such subjects as care of children and mothers, abortions, social insurance, public health work, medical training, care of the sick, control of tuberculosis and venereal diseases.

Every doctor in Soviet Russia is a state official with regulated salary; every individual a state responsibility. A doctor may choose his location for practise, may practise privately after his daily duties to the state are finished, and he may specialize after qualifying by special examination. While the standards of medical education are lower than in this country, they are improving. More women than men are now practising, and there is no sex discrimination.

The individual may choose his doctor within his district. If he is sick and unable to leave his home he is visited by a doctor. Whenever it is possible he is made to go to a neighborhood dispensary and is then sent to a central polyclinic or hospital. In most cases there is no fee. As an individual, a woman may decide the question regarding abortions after the first pregnancy; the state regulates the procedure. Prenatal and postnatal care are supplied, and state care of children is free to the working mother.

There are many rest and convalescent homes and sanatoria, chiefly for tuberculous patients. Adequate provision is made for the control and treatment of venereal diseases.

The good and bad points of this system of socialized medicine are evaluated by the authors with an attempt to predict the future. It is obvious that they consider it a most interesting experiment, worthy of extension.

The book is a valuable summary of information much of which has previously appeared in magazines and books. The medical reader will wish that the first half had been reduced and the second half given more extensively. As a "Sketch" it is recommended to all.

ANNA DEAN DULANEY

Diseases of the Heart—*By Sir Thomas Lewis, M.D. New York: Macmillan,* 1933. 297 pp. Price, $3.50.

This well written book carries out essentially what the author states in the preface as his intention; *viz.*, simplicity in teaching. It does not pretend to be a treatise upon all the phases of cardiac pathology, and much in the way of theory has been left out. The classification of the diseases of the heart is necessarily anatomical in certain instances, yet the physiological viewpoint is always borne in mind. The author in his discussion keeps before the reader the idea of Sir James MacKenzie—to use one's own special senses and sound clinical observation as a means of diagnosis. The use of the electrocardiograph is not emphasized, though it is by no means deprecated. Where it is necessary to make a point clear, electrocardiograms are used. All the while, the needs of the man in general practice who may not have at his disposal elaborate mechanical aids, is kept in view, and the author gives in a very clear manner the points which he wishes to make.

The use of elaborate and many times confusing technical terms is avoided. Of special interest are the chapters on cardiac failure, coronary thrombosis, and angina.

One chapter given to the discussion child-bearing, anesthetics and operations, is especially timely, as very few authors take the trouble to consider these subjects except in the most casual manner. His discussion of these subjects is most helpful to the general practitioner.

This book can be recommended to every physician whatever may be his

specialty, for heart disease in one way or another touches every field of medicine. It supplies the need for the one who wants accurate, well classified information in a hurry and who does not wish to have it cluttered with nonessential details.

The book is well printed and put together. The illustrations, though not very abundant, are excellent.

EDGAR D. BASKETT

Annual Report of the Surgeon General of the Public Health Service of the United States for the Fiscal Year 1933—*Washington: U. S. Government Printing Service*, 1933. Price, $0.75.

This report is shorter than usual. It is known that funds have been cut and personnel reduced, with the necessary curtailment of activities. However, the report is encouraging.

The report begins with a review of world health conditions which necessarily affect us, though we have been fortunate through our quarantine service in keeping epidemic diseases from our shores. Plague continues to be the most imminent menace of all diseases. India had 38,000 deaths from plague in 1932, an increase of about 10,000 over 1931. Typhus fever has been somewhat prevalent in Mexico, and an outbreak of some 955 cases has occurred in this country, confined largely to 3 southern states which recently took up the extensive culture of peanuts.

In the United States the health conditions have been good, the general death rate for 1932 being the lowest ever recorded, and those for tuberculosis, diphtheria, and typhoid fever have also reached new low records. There were some increases in the death rate from the degenerative diseases, such as cancer, heart diseases, etc.; but this is only a continuance of what has been happening for some years. In spite of the distressing economic conditions, unfavorable results have not yet become apparent in the crude death rate, though it has been shown that there is increase of illness among the unemployed, whose economic condition is therefore below par.

The infant mortality has decreased. In 1915, 1 infant out of every 10 born died in the first year, while in 1932, only 1 out of every 17 died. Against this, the birth rate has continued to decline, being now 17.3 per 1,000 population.

Smallpox has decreased, but is still one of the blots on our record. More than 400 cases of cholera were reported in the Philippine Islands, but it did not reach this country. Rocky Mountain Spotted Fever continues to be a menace in the Rocky Mountain and Pacific States, and 103 cases, with 10 deaths, were reported on the Atlantic seaboard. Pellagra has decreased from 7,074 deaths in 1924 to 4,091 in 1932, but many health officers anticipate an increase due to poor economic conditions. Undulant fever continued to attract attention, 1,502 cases, with 71 deaths, having been reported in 1932.

The usual quarantine service has been carried on efficiently, 10,935 vessels having been inspected on arrival at domestic ports, and 2,982 at insular ports, while in foreign ports, 179 vessels were inspected before sailing. An interesting feature and one that is comparatively new, is the inspection of airplanes, 4,186 of which arrived at air ports from foreign lands, carrying 25,767 persons. Owing to the lack of personnel, 1,977 entered without the examination required by law. Inspection of airplanes failed to reveal the presence of any disease-bearing mosquitoes in those which had been sprayed during the flight with an oil extract of pyrethrum flowers, though experiments have shown that planes could

and did carry such mosquitoes alive when this precaution was omitted.

During the year a beginning was made on two narcotic farms, one at Lexington, Ky., and one at Fort Worth, Tex.

The Service has moved to its new building on Constitution Avenue and 19th Street, N. W. An interesting history is given of the housing of the Service since its establishment in 1798. Among important matters in which results have been achieved are those on malaria, in which county-wide dusting at 21-day periods has been carried out in an effort to suppress the disease. Studies have also been made on plasmochin and atebrin, the latter of which have been extremely promising. It seems to be superior to quinine, acting somewhat more quickly and without discomfort to the patient. In coöperation with the State Hospital for Insane, Columbia, S. C., Dr. Mayne has established strains of benign tertian, quartan, and a relatively mild strain of estivo-autumnal malaria. Shipment of live mosquitoes and blood as well as sporozoites from the salivary gland has been carried out successfully.

The Service has carried on extensive studies on hemolytic streptococci and and has developed a streptococcus toxoid for immunization against scarlet fever which has been successful in a series of 3 doses in over 80 per cent of 1,700 persons. Diphtheria studies have been continued, and it is announced that the alum precipitated toxoid in a single dose of 1 c.c. is at least as effective as 2 doses of 1 c.c. each of the original unmodified toxoid. It seems entirely probable that this treatment will supersede other prophylactics. Altogether, the report is encouraging, and should be read by health officers and those interested in the state of the public health.

MAZŸCK P. RAVENEL

Outline of Immunity—*By W. W. C. Topley, M.A., M.D., F.R.C.P., F.R.S. Baltimore: Wood,* 1933. 416 pp. Price, $6.00.

This book does much to remedy the unsatisfactory position of Immunity as a subject, to which the author refers in the preface. It is a systematic and condensed presentation of an immense amount of material. While a considerable proportion of the printed contents and illustrations have already appeared in *The Principles of Bacteriology and Immunity,* written by the author and his associate, Professor Wilson, these parts have been revised and either condensed or extended. In the present form the book serves as a specialized text for the advanced student, with a sound foundation in clinical bacteriology. It is in no sense a reference book to be recommended to the beginning student.

The contents, which cover thoroughly the field of immunological interest, include discussions of infection, the mechanism of bacterial invasion and varied defenses of the host, the antigenic rôle of bacteria, with a consideration of their chemical make up, herd immunity, virus immunity. Especially clear are the accounts of the responses of bacteria to the defense mechanisms of the host and the origin of natural antibodies.

Four chapters of the book deal with the practical application of immunity in diagnosis, in prophylaxis, and in treatment, and the standardization of immunological reagents.

At the end of each chapter a concise summary of the important points is given in numerical order with the list of references following.

The term " mechanism " is a favorite one with the author, and data are critically considered from this point of view. The facts are impartially stated and while the author in no way evades

personal opinions, these are given in manner devoid of dogmatism.

The general make up of the book is pleasing. It offers sufficient "reason" for having been written.

ANNA DEAN DULANEY

Industrial Health Service—*By Leverett Dale Bristol, M.D., Dr.P.H., Health Director, American Telephone and Telegraph Co. Philadelphia: Lea & Febiger,* 1933. 170 pp. Price, $2.00.

This handy little book is all that its name implies. It present in a condensed form the more important facts with reference to the health of workers in industry, and these from three standpoints—the management, the supervisor, and the individual himself. The book is accordingly divided into three parts with brisk, short chapters composing each.

While there are no illustrations or formal tables, there is a good index as well as two appendices carrying appraisal forms, the one for smaller industries and the other for personnel and industrial relation services in general.

It is interesting to note that a suggested appraisal form for industrial hygiene was presented to the Committee on Standard Practices of the American Public Health Association some years ago, but, so far as the reviewer knows, this is the first attempt to give definite form to such an idea after a presentation of some parts of it to the Section on Industrial Hygiene (at the Washington Meeting in 1932).

Examination of the substance matter of various chapters shows that the work is quite up-to-date, quite in keeping with the best thought, and something which those interested in industrial health efficiency should be glad to have available for ready reference.

EMERY R. HAYHURST

Contagious Diseases—What They Are and How to Deal With Them—*By W. W. Bauer, M.D. New York: Knopf,* 1934. 218 pp. Price, $2.00.

This book written for the layman deserves more than usual commendation. It is easily understandable to the average mother for whom it is written specially. The last part of the book is not so good as the first. In our judgment, there are two outstanding faults: Toxin-antitoxin is still mentioned, and there is no mention of alum precipitated toxoid, although this is on the market and bids fair to supersede all other preparations, and certainly toxin-antitoxin. The second criticism is that the treatment of prevention of tuberculosis is entirely inadequate. There is practically no mention of the danger of bovine tuberculosis to human beings, though it is universally recognized not only as a cause of death, but a still greater cause of disability.

The book is well written and well printed, and we hope for it a wide circulation.

MAZŸCK P. RAVENEL

Behind the Doctor—*By Logan Clendening, M.D. New York: Knopf,* 1933. Price, $3.75.

Many readers of newspapers will recognize the author of this book as the writer of daily health articles which are familiar through the pictures of Dr. Clendening which always accompany them.

The same type of readers will find this book interesting and instructive for it has been written for the layman. Scientific facts are there, but these are greatly embellished by fictional dialogue and a gossipy style that will lead the layman to believe that scientific discoveries and medical advancement are veritable romance, that the men concerned were very human creatures.

The author justifies the fictional form by the expressed belief that medical discoveries in the form of straight historical narrative would not appeal to the type of reader for whom the book is intended. The sprightly conversation, the intimate glimpse into personal lives are either "extracted from their own writings or are reasonable deductions from those writings of what the character would have said." In any event, it is a rather gay account of the many discoveries and tremendous background of knowledge which goes into the making of the present-day doctor.

There is a brief account of the beginnings of medical knowledge—the medicine man with his final displacement by the fathers of modern medicine, Hippocrates and Galen. Then follow sections dealing with the early development of the fundamental sciences, anatomy and physiology, and the resulting influences in treatment of disease; preventive medicine and vaccination, the entrance of laboratory examinations into medicine, the development of modern medicine and surgery, and the progress of all branches of medicine since 1900.

A bibliography giving references for each chapter, and citing the places where the writer has "wandered without guidance or authority," closes the book. There are numerous photographs and original drawings which add to the attractiveness of the epic.

The book is without doubt very interesting and much real information may be obtained. The style is more interesting while reading page 1 than when pages 200 or 300 are reached, by which time it seems a trifle facetious and too "popular."

The subdivision of the chapter on Preventing Plague and Pestilence headed "The Dear Little Boy" turns out to be an account of Edward Wortley Montagu, Jr. Oliver Wendell Holmes's appreciation of the many sources of medical knowledge is elaborated upon in chapters describing, "What Medicine Learned from a Sailor," "What Medicine Learned from an Old Market Woman," "What Medicine Learned from a Postmaster," "What Medicine Learned from a Singing Master."

The book is beautifully gotten up, with heavy paper and good type. As a dramatized account of medical progress in very readable form it is recommended.

ANNA DEAN DULANEY

BOOKS RECEIVED

OUR COMMON ENEMY: COLDS. By Editors of "Fortune." New York: McBride, 1934. 102 pp. Price, $1.00.

BLINDNESS AND THE BLIND IN THE UNITED STATES. By HARRY BEST. New York: Macmillan, 1934. 714 pp. Price, $6.50.

ALCOHOL. ITS EFFECTS ON MAN. By Haven Emerson. New York: Appleton, 1934. 114 pp. Price, $1.00.

HEALTH EDUCATION IN AN AMERICAN CITY. By Louise Franklin Bache. New York: Doubleday, 1934. 116 pp. Price, $2.00.

PEDIATRIC NURSING, INCLUDING THE CARE OF THE WELL INFANT AND CHILD. 3d ed. By Gladys Sellew. Philadelphia: Saunders, 1934. 609 pp. Price, $2.50.

HEALTH THROUGH THE AGES. By C.-E. A. Winslow and Grace T. Hallock. Metropolitan Life Ins. Co., 1933. 64 pp. Free to junior and senior high school classes.

NATURE, M.D. HEALING FORCES OF HEAT, LIGHT, WATER, ELECTRICITY AND EXERCISE. By Richard Kovacs. New York: Appleton, 1934. 181 pp. Price, $2.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Iconoclasts Air Views on Health Examinations—"The Periodic Health Examination is a procedure which will occasionally reveal early remediable diseases. It is a luxury and should be paid for as other luxuries. . . . The examination provides an opportunity to discuss hygienic habits of the individual and to educate him in the value of investigating any recently acquired trivial signs or symptoms. From this leads our (Committee on Public Health, Massachusetts Medical Society) conclusion: that universal investigation of recently acquired trivial signs and symptoms by the family doctor would be more profitable than the periodic health examination, and that it should be substituted for the periodic health examination in future propaganda."

ANON. The Periodic Health Examination. New Eng. J. Med. 210, 4:225 (Jan. 25), 1934.

Does Impeded Drainage of the Breast Cause Cancer?—Of 200 cases of mammary cancer, only 8 per cent gave a normal nursing history, or a history free from factors causing impaired drainage; every third pregnancy had ended in a miscarriage or abortion. In the control group, one 1 in 7 pregnancies ended this way, while 80 per cent gave a normal nursing history.

ADAIR, F. E. Etiological Factors of Mammary Cancer in 200 Women. New York State J. Med. 34, 2:61 (Jan.), 1934.

Skin vs. Bacteria—"Living bacteria placed on the skin rapidly disappear from this surface. They cannot be demonstrated by cultural or tinctorial methods 30 or 40 minutes after contact with the surface of the skin."

ARNOLD, L. and ALEXANDER, B. The Self-Disinfecting Power of the Skin. Am. J. Hyg. 19, 1:217 (Jan.), 1934.

Varied Pictures of an Influenza Epidemic—Immediately after the 1928 influenza outbreak, surveys were made in 14 cities and the result analyzed in relation to age, sex, and color. Probably the most valuable findings will be seen in the variation in extent and severity in the several communities studied.

COLLINS, S. D. The Influenza Epidemic of 1928–1929 in 14 Surveyed Localities in the United States. Pub. Health Rep. 49, 1:1 (Jan. 5), 1934.

What Makes the Vitamins Tick—The first of three excellent lectures on vitamins deals with their biochemistry. It is to be regretted that it appears only in a British journal and will not be available to all health workers for, though the chemical discussion will be quite beyond the comprehension of all but a handful, the reading would be worth while for all if only to disabuse our minds of any parochial ideas that the sum total of scientific advance is confined to the United States. The second and third lectures deal with the physiological functions of vitamins and the eminently practical problems of human nutrition. The author's thesis is that there is terrifying evidence of malnutrition despite the fact that there is not a large number of people actually short of food. When Englishmen were raised chiefly on coarse bread, cheese and beer, malnourishment was less rife than it is today, he tells us.

DRUMMOND, J. C. Modern Views of Vitamins and Their Functions. J. State Med. 42, 1:3 (Jan.), 1934.

Safeguarding Milk and Getting It Consumed—How Louisville enacted and enforced the standard milk code and boosted the consumption of milk

produced under it is recounted with sufficient detail to make the record of value to others.

DUGAN, S. H. V. Pure Milk Problem. Municipal Sanitation 5, 1:13 (Jan.), 1934.

How to Find Undernourished Children—To aid in sorting out school children who should be seen by a physician, an index is proposed which is better than height-weight-age and other criteria of nutritional status. Three simple measurements: arm girth, chest depth, and hip width, are used to screen out the undernourished children who are subjected to more extensive tests or sent directly for medical examination.

FRANZEN, R. and PALMER, G. T. The A.C.H. Index of Nutritional Status. Child H. Bull. 10, 1:26 (Jan.), 1934.

Tuberculosis Aggravated by Silicosis—Four papers from the annual meeting of the N.T.A. are supplemented by another, on the roentgenological aspects, to form a symposium on the relationship of silicosis and tuberculosis. The series presents much that is new on the subject; hence it is an important addition to the literature of industrial hygiene.

GARDNER, L. U., LANZA, A. J., *et al.* Silicosis (etc.). Am. Rev. Tuberc. 29, 1:1 (Jan.), 1934.

A Good Word for Russian Public Hygiene—How women and children are cared for under the Russian scheme of socialized medicine is told with sufficient thoroughness to excite the inevitable high-powered debate.

KINGSBURY, J. A. Russia Demonstrates Socialized Health. Pub. Health Nurs. 26, 1:5 (Jan.), 1934.

Where Health Insurance Has Been Tried—No country in which a scheme of compulsory health insurance has been adopted has ever abolished it. Criticism has not been lacking, but it is directed against practices not the principle, which is now approved by the International Medical Association Council.

MCCLEARY, G. F. Health Insurance in Europe. Milbank Quart. Bull. 12, 1:3 (Jan.), 1934.

Dust Particles Injected Into the Body—Dusts of different kinds were injected intraperitoneally into guinea pigs. Calcium dusts were absorbed without producing scar tissue; quartz and flint produced nodules which continued to increase in size; soapstone, coal, etc., were inert in reaction. This response may be used for the classification of industrial dusts.

MILLER, J. W. and SAYERS, R. R. The Physiological Response of the Peritoneal Tissue to Dusts Introduced as Foreign Bodies. Pub. Health Rep. 49, 3:80 (Jan. 19), 1934.

What Nurses Ask For—"In the health officer she expects superior knowledge of public health needs, leadership in defining policies, interpretation of scientific facts, guidance in adapting public health procedures, coördination of all community health activities, popularization of her services, a connecting link and buffer to the medical profession, a health educator, and an executive who understands and appreciates the individual"; a large order!

MILLER, R. K. What the Nurse Expects of the Health Officer. Pub. Health Nurs. 26, 1:16 (Jan.), 1934.

Diabetes Increases Tuberculosis Susceptibility—Pulmonary tuberculosis occurred 10 times more frequently in juvenile diabetics than among normal children, and the incidence of tuberculosis among adult diabetics is increasing despite a reduction in community contacts. Does diabetes lower resistance to tuberculosis? This and some other questions are studied.

ROOT, H. F. The Association of Diabetes and Tuberculosis. New Eng. J. Med. 210, 1:1 (Jan. 4), 1934.

NEWS FROM THE FIELD

Resolution Adopted by the Southern Medical Association at Its Richmond Meeting

DR. William Weston, Columbia, South Carolina, a past member of the Council, accompanied by Dr. Robert Wilson, Charleston, S. C., a past president of the Association, appeared before the Council and presented the following resolutions:

Whereas, Investigations reveal information that nutritional deficiency is constantly assuming a more important rôle as the etiological factor of many diseases that have heretofore not been understood; and as it is now known that there are present in the United States a great many diseases belonging to this group, some of which diseases are widespread, increasing in number and are seriously undermining the health and vitality of the people of this country; and

Whereas, We have little definite knowledge of the chemistry of our foods, because analyses which have been made in order to determine their nutritional value have been local or sectional and no sustained effort has been made upon a broad scale to supply such information as is necessary in order to determine the localities from which our food supply should be drawn; and,

Whereas, It is known that in certain localities and under certain circumstances, the chemical elements of common foods, such as milk, fruits, vegetables and cereals, show marked differences in value while it is known that in other localities certain vegetables absorb poisonous substances which render them of doubtful food value; and

Whereas, no real progress can be made in the solution of nutritional deficiency diseases until chemical analyses of foods are made upon a broad and impartial scale and the relationships of the different chemical elements studied with scientific care; and

Whereas, The whole scientific world is aroused to the importance of this fundamental work in order that grave public health problems and the vitality and strength of the people of this nation be safeguarded;

Therefore, Be It Resolved,

(1) That the Federal authorities be urged to undertake this work upon a broad, comprehensive and impartial scale in collaboration with selected medical colleges in the different sections of the country.

(2) That the Southern Medical Association urge that this work be undertaken at the earliest possible moment.

(3) That the Southern Medical Association request the coöperation of all other state and national medical associations in this country.

(4) That the Southern Medical Association appoint a committee whose duty and purpose it shall be to confer with the National authorities at the earliest possible moment and proceed with the work.

The resolutions were unanimously adopted, Dr. William Weston to be the Chairman of the special committee provided for in the resolutions, the two other members of the committee to be selected by the Chairman in conference with the President. The Chairman with approval of the President appointed as the other two members of this Committee: Dr. M. P. Ravenel, Columbia, Missouri; and Dr. J. E. Knighton, Shreveport, Louisiana.

The report of the Board of Trustees, incorporating the report of the Secretary-Manager, was received, discussed, and unanimously approved.—*South. M. J.* Jan., 1934, pp. 70–71.

National Commission on Correct Diet

THE National Commission on Correct Diet appointed by the Government of Uruguay a few years ago has recently been conducting a campaign for the purification of the milk supply. The commission supervises the production, pasteurization, and handling of milk in different places and takes part in the enforcement of the municipal regulations concerning milk in Montevideo. The commission has also been active in teaching dietetics to the public, and particularly to school children, and

it has made a study of the nutrition of school children in the interior of the country. Members of the commission have given lectures on dietetics in the 12 child-health centers in Montevideo and in other child-welfare institutions.—*Boletín de la Oficina Sanitaria Panamericans*. Washington, Sept., 1933.

AMERICAN SOCIAL HYGIENE ASSOCIATION ELECTS NEW OFFICERS

THE annual business meeting of the American Social Hygiene Association was held January 31, at their offices in New York. Officers were elected as follows:

Honorary President, William H. Welch, M.D.; President, Edward L. Keyes, M.D.; Vice-Presidents, Roscoe Pound, Eugene L. Bishop, M.D., Ray Lyman Wilbur, M.D., and Mary E. Woolley; Treasurer, Timothy N. Pfeiffer; Secretary, Mrs. Henry D. Dakin.

The month of March, 1934, marks the 20th anniversary of incorporation of the Association, which began its work under the guidance of President Charles W. Eliot, John D. Rockefeller, Jr., Henry Lee Higginson, Grace M. Dodge, and a distinguished group of directors.

SOUTHERN MEDICAL ASSOCIATION TO MEET IN TEXAS

THE next meeting of the Southern Medical Association will be held at San Antonio, Tex., from November 13 to 16, 1934.

NEGRO EDUCATION

THE Office of Education of the U. S. Department of the Interior is for the first time calling a National Conference on Fundamental Problems in Negro Education, to be held at Washington, May 1–6.

One of the problems to be discussed is the problem of education as it relates to Negro health. The conference will attempt to understand the relations of the educational problems involved in the professional education of Negroes, student health education, and child health. The subjects of vocational guidance, citizenship, and home life and health will be studied.

PERSONALS

GRACE M. COFFMAN, formerly director of the Tacoma, Wash., Public Health Nursing Association, is the new Assistant Director on the staff of the National Organization for Public Health Nursing, New York.

LOUISE M. TATTERSHALL, for almost 10 years statistician of the National Organization for Public Health Nursing, New York, has resigned to accept a statistical position with the Children's Bureau in Washington, D. C. Mrs. Anna J. Miller, formerly with the American Child Health Association, has been appointed temporarily to fill Miss Tattershall's place.

JAMES E. PERKINS, M.D., DR.P.H., has been provisionally appointed epidemiologist on the staff of the Division of Communicable Diseases of the State of New York.

HUGH R. LEAVELL, M.D., member A.P.H.A., has been appointed Health Officer of Louisville, Ky. He received his B.S. at the University of Virginia, and his M.D. at Harvard. He served as interne in the Massachusetts Hospital, Columbia Presbyterian Hospital, and Johns Hopkins University. From 1930 to 1933 he was instructor of medicine in the University of Louisville.

DEATH

LINSLY R. WILLIAMS, M.D., Fellow A.P.H.A., director of the New York Academy of Medicine, died January 8, after a long illness.

CONFERENCES

March 29, 30, 1934, Annual Meeting of the American Association of Pathologists and Bacteriologists, Toronto, Ont., Canada.

April 1–8, National Negro Health Week.

April 16–17, Eighth Annual Meeting of the Florida Section of the American Water Works Association, Daytona Beach, Fla.

April, 1934, Statistical Conference of the Royal Statistical Society and the International Statistical Institute, London, England.

April, 1934, Southeastern Section, American Water Works Association, Augusta, Ga.

April 16–20, 1934, Eighteenth Annual Clinical Session of the American College of Physicians, Chicago, Ill.

April 23–27, Biennial Nurses' Associations Meeting. American Nurses' Association, National Organization for Public Health Nursing, and National League of Nursing Education, Washington, D. C.

May 1–6, National Conference on Fundamental Problems in Negro Education, Washington, D. C.

May 13–19, 38th Annual Convention of the National Congress of Parents and Teachers, Des Moines, Ia.

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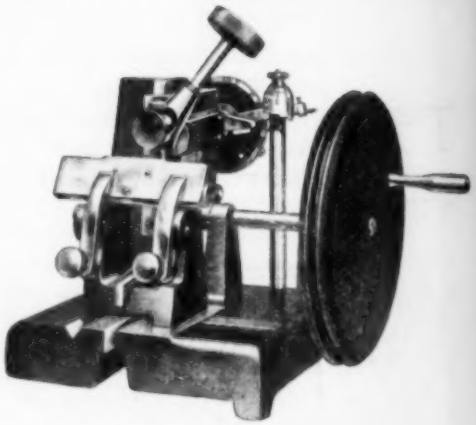

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